

## PATENT ABSTRACTS OF JAPAN

(11)Publication number : 2002-189195

(43)Date of publication of application : 05.07.2002

(51)Int.Cl.

G02C 5/00

G02C 1/02

G02C 13/00

(21)Application number : 2000-387009

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(22)Date of filing : 20.12.2000

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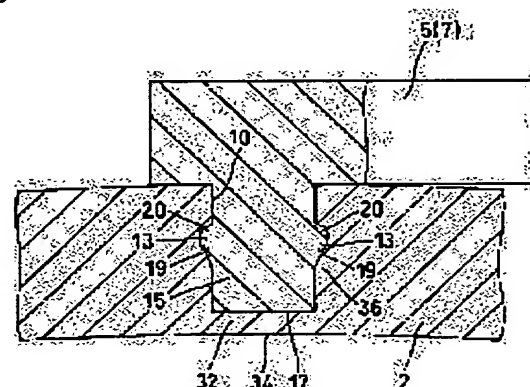
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## (54) RIMLESS GLASSES AND METHOD OF MANUFACTURING FOR THE SAME

## (57)Abstract:

PROBLEM TO BE SOLVED: To surely and easily connect a bridge and wraparound endpieces to lenses.

SOLUTION: In connecting the bridge and the wraparound endpieces to the inner and outer edges of the plastic lenses 2, the ends of the bridge and the ends of the wraparound endpieces are projectingly provided with connecting shafts 15. The connecting shafts 15 are provided with projecting parts 13 on their outer peripheries. The connecting shafts 15 are pushed into mounting holes 10 disposed at the edges of the lenses 2. The projecting parts 13 are embedded into inner peripheral parts 36 of the mounting holes which are softened by heating and are then hardened. The connecting shafts 15 are prevented from removing and rotating by this embedment.



## LEGAL STATUS

[Date of request for examination]

23.01.2001

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

3476772

[Date of registration]

26.09.2003

[Number of appeal against examiner's decision of rejection]

(19) 日本国特許庁 (J P)

(12) 公開特許公報 (A)

(11) 特許出願公開番号

特開2002-189195

(P2002-189195A)

(43) 公開日 平成14年7月5日 (2002.7.5)

(51) Int.Cl.<sup>7</sup>

G 0 2 C 5/00  
1/02  
13/00

識別記号

F I

G 0 2 C 5/00  
1/02  
13/00

データベース (参考)

2 H 0 0 6

審査請求 有 請求項の数16 O L (全 15 頁)

(21) 出願番号 特願2000-387009(P2000-387009)

(22) 出願日 平成12年12月20日 (2000. 12. 20)

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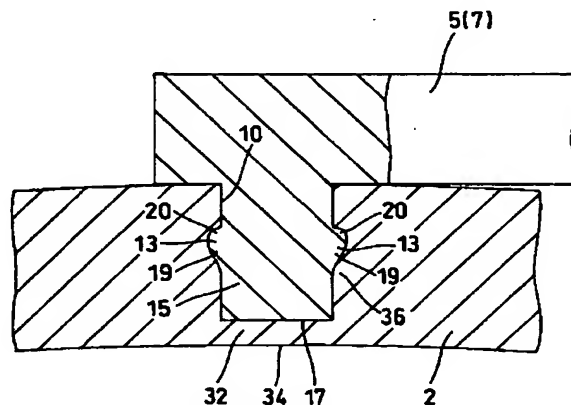
Fターム (参考) 2H006 AA00 DA01

(54) 【発明の名称】 縁無し眼鏡及びその製造方法

(57) 【要約】

【課題】 レンズに対するブリッジ及びヨロイの連結を確実且つ容易に行う。

【解決手段】 プラスチック製レンズ2の内外の縁部分にブリッジとヨロイを連結するに際して、ブリッジの端部分及びヨロイの端部分に連結軸15を突設する。連結軸15には、その外周に突部13が設けられており、該連結軸15が、レンズ2の縁部分に設けられた取付孔10に押し込まれている。突部13は、加熱により軟化せしめられてその後硬化した、取付孔の内周部分36に埋設されており、この埋設により、連結軸15の抜け止めと回り止めが図られている。



## 【特許請求の範囲】

【請求項 1】 左右のプラスチック製レンズの内側の縁部分相互をブリッジで連結すると共に、前記レンズの外側の縁部分にヨロイの端部分を連結してなる縁無し眼鏡において、

前記ブリッジの端部分及び／又は前記ヨロイの端部分には、外周に突部が設けられた連結軸が突設され、該連結軸が、レンズの縁部分に設けられた取付孔に押し込まれており、前記突部が、加熱により軟化せしめられてその後硬化した、取付孔の内周部分に埋設され、該連結軸の抜け止めと回り止めが図られていることを特徴とする縁無し眼鏡。

【請求項 2】 左右のプラスチック製レンズの内側の縁部分相互をブリッジで連結すると共に、前記レンズの外側の縁部分にヨロイの端部分を連結してなる縁無し眼鏡において、

前記ブリッジの端部分及び／又は前記ヨロイの端部分には、外周に凹部が設けられた連結軸が突設され、該連結軸が、レンズの縁部分に設けられた取付孔に押し込まれており、加熱により軟化せしめられた取付孔の内周部分のプラスチックが前記凹部に入り込んで硬化され、該連結軸の抜け止めと回り止めが図られていることを特徴とする縁無し眼鏡。

【請求項 3】 前記突部は、前記連結軸の押し込み方向で見て、その前側の突出量がその後側の突出量よりも小さく設定されていることを特徴とする請求項 1 記載の縁無し眼鏡。

【請求項 4】 前記レンズは、前記取付孔を設ける部分が他の部分よりも弾力性を有する柔軟部として形成されていることを特徴とする請求項 1、2 又は 3 記載の縁無し眼鏡。

【請求項 5】 前記レンズは、前記取付孔を設ける部分が他の部分よりも弾力性を有する柔軟部として形成されており、該柔軟部は、前記突部が埋設される内部が柔軟に形成され、且つ表面部と裏面部が硬質に形成されていることを特徴とする請求項 1 記載の縁無し眼鏡。

【請求項 6】 前記レンズは、前記取付孔を設ける部分が他の部分よりも弾力性を有する柔軟部として形成されており、該柔軟部は、前記凹部が位置せしめられる内部が柔軟に形成され、且つ表面部と裏面部が硬質に形成されていることを特徴とする請求項 2 記載の縁無し眼鏡。

【請求項 7】 前記取付孔は、底部を具えた盲孔であって、該盲孔に前記連結軸が押し込まれていることを特徴とする請求項 1～6 のいずれかに記載の縁無し眼鏡。

【請求項 8】 前記取付孔は、レンズの前面側（眼鏡着用者の顔面に面する側と反対側）が塞がれた底部を有し且つ後端が開放する盲孔であって、前記連結軸は、該盲孔の後端開口より押し込まれて、該連結軸の前端面が前記底部に押し付けられた状態にあり、前記連結軸の前端面に設けられた装飾が前記盲孔の透明な底部を透かして

レンズの前面側から視認できることを特徴とする請求項 1～7 のいずれかに記載の縁無し眼鏡。

【請求項 9】 前記端部分は、前記取付孔に前記連結軸を押し込んだ際に該取付孔の周辺部分が熱変形で歪んだ場合、該歪んだ周辺部分を覆い隠す大きさに形成されていることを特徴とする請求項 1～8 のいずれかに記載の縁無し眼鏡。

【請求項 10】 左右のプラスチック製レンズの内側の縁部分相互をブリッジで連結すると共に、前記レンズの外側の縁部分にヨロイの端部分を連結してなる縁無し眼鏡の製造方法であって、

前記ブリッジの端部分及び／又は前記ヨロイの端部分は、外周に突部が設けられた連結軸が突設されたものとなし、該連結軸を、前記レンズの縁部分に設けられた取付孔に押し込み、該押し込みの際に前記取付孔の内周部分を熱で軟化せしめ該軟化した内周部分に前記突部を埋設状態とし、その後における前記内周部分の硬化によって前記連結軸の抜け止めと回り止めを図ることを特徴とする縁無し眼鏡の製造方法。

【請求項 11】 左右のプラスチック製レンズの内側の縁部分相互をブリッジで連結すると共に、前記レンズの外側の縁部分にヨロイの端部分を連結してなる縁無し眼鏡の製造方法であって、

前記ブリッジの端部分及び／又は前記ヨロイの端部分は、外周に凹部が設けられた連結軸が突設されたものとなし、該連結軸を、前記レンズの縁部分に設けられた取付孔に押し込み、該押し込みの際に前記取付孔の内周部分を熱で軟化せしめ、該軟化した内周部分のプラスチックを前記凹部に入り込ませ、その後における前記内周部分及び前記入り込んだプラスチックの硬化によって、前記連結軸の抜け止めと回り止めを図ることを特徴とする縁無し眼鏡の製造方法。

【請求項 12】 左右のプラスチック製レンズの内側の縁部分相互をブリッジで連結すると共に、前記レンズの外側の縁部分にヨロイの端部分を連結してなる縁無し眼鏡の製造方法であって、

前記ブリッジの端部分及び／又は前記ヨロイの端部分は、外周面に凹部が設けられた連結軸が突設されたものとなし、又、前記レンズの縁部分には、内周部分の所要部位に内面突部を有した取付孔が設けられたものとなし、該連結軸を前記取付孔に押し込み、該押し込みの際に前記内面突部を熱で軟化せしめ、該軟化したプラスチックを前記凹部に入り込ませ、その後における前記内周部分及び前記入り込んだプラスチックの硬化によって、前記連結軸の抜け止めと回り止めを図ることを特徴とする縁無し眼鏡の製造方法。

【請求項 13】 前記取付孔が、底部を具えた盲孔である場合、該底部側の直径が他の部分よりも小さく形成されることによって、直径の小さい該部分が前記内面突部とされていることを特徴とする請求項 12 記載の縁無し

眼鏡の製造方法。

【請求項14】 前記連結軸を予め加熱して前記取付孔に押し込み、該押し込みの際に、前記取付孔の内周部分を前記連結軸が帯有する熱で軟化せしめることを特徴とする請求項10、11、12又は13記載の縁無し眼鏡の製造方法。

【請求項15】 前記取付孔の所要部位に内面突部を設けると共に、前記連結軸を予め加熱して前記取付孔に押し込み、該押し込みの際に前記内面突部を前記連結軸が帯有する熱で軟化せしめ、該軟化したプラスチックを前記凹部に入り込ませることを特徴とする請求項11、12又は13記載の縁無し眼鏡の製造方法。

【請求項16】 前記連結軸に超音波振動を付与しながら該連結軸を前記取付孔に押し込み、該押し込みの際に、前記取付孔の内周部分を前記超音波振動により発生した摩擦熱で軟化せしめることを特徴とする請求項10、11、12又は13記載の縁無し眼鏡の製造方法。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】本発明は、ブリッジの端部分やヨロイの端部分をレンズに連結する所謂ツーポイント眼鏡と称されている縁無し眼鏡に関するものである。より詳しくは、ブリッジやヨロイの端部分が有する連結軸をレンズに設けた取付孔に押し込んで固定してなる縁無し眼鏡に関するものである。

【0002】

【従来の技術】ブリッジの端部分をレンズの内側の縁部分に連結すると共に、テンブルの先端側に設けられたヨロイの端部分をレンズの外側の縁部分に連結した構成の所謂ツーポイント眼鏡と称されている縁無し眼鏡における該連結構造は、従来、次のように構成されるのが一般的であった。

【0003】即ち前記端部分aは、図23～24に示すように、レンズ側面bと当接する湾曲した当接片cを連結部本体dの端部にロウ付けすると共に、レンズ面の内方側に突出し且つ内端部分に挿通孔eが設けられた連結片fを前記当接片cにロウ付けして構成されていた。そして、かかる構成の連結部aをレンズgに連結するには、図24に示すように、該レンズgに設けた連結孔hにその一端から、樹脂ワッシャjを介在させて連結ネジkを挿通すると共に、該連結ネジkの、レンズの他面側に突出するネジ軸部mに樹脂ワッシャjを装着し、該樹脂ワッシャjから突出した部分にナットnを螺合し締め付けることにより、前記表裏の樹脂ワッシャj、jを所要に弾性変形させるように締め付け、これにより、前記連結部aをレンズgに固定していた。そして該固定状態においては、レンズ側面bに当接状態にある前記当接片cの係合作用によって、前記連結部aの回り止めを図っていた。

【0004】

【発明が解決しようとする課題】しかしながら、かかる従来の縁無し眼鏡には次のような問題点があった。

(1) 連結部に緩みが生じやすい問題点

前記連結部aをレンズgに連結する手段は、連結片cの先端側の部分pやナットnがレンズ面を損傷するのを防止する目的で、前記連結孔の表裏側に樹脂ワッシャj、jを介在させ、該樹脂ワッシャを所要に弾性圧縮変形させるように前記ナットnを締め付けて行っていたが、弾性圧縮状態にある樹脂ワッシャj、jは、その弾性圧縮状態が暫く継続すると、当初の締め付け強さに樹脂が馴染んでその弾力性が劣化し、その結果、連結部にガタツキが発生する問題があった。このようにガタツキが発生したときは、従来は、前記ナットnを更に締め付けて前記樹脂ワッシャj、jに再び所要の弾性圧縮を生じさせ、これによりガタツキを解消していた。しかしながら、該樹脂ワッシャの弾性は再び容易に劣化し易いことから、ガタツキの解消はほんの一時的なもので、再びガタツキが発生することになった。このようになったときは、再度ナットnを締め直していたのであるが、このようなナットの締め付けを繰り返すうちに前記樹脂ワッシャは徐々に硬くなってそのうちに潰れてしまい、もはやナットの締め付けによるガタツキ解消は不可能になってしまう。

【0005】(2) 又、前記従来の連結構造によるときは、レンズgに連結孔hを設けるに際して、前記当接片cと挿通孔eとの間の距離に合わせて連結孔hを精度よく位置決めして明ける必要があった。もしも、形成した連結孔がレンズgの縁に近過ぎると、前記当接片cがレンズ側面bに正しく当接しなくなって該当接片cが所要の回り止め作用を発揮できないこととなり、連結構造にガタツキが発生する問題が生ずるし、逆に連結孔fがレンズgの縁から遠過ぎると、当接片cがレンズ側面bに当接した状態で、前記連結片fの挿通孔eを連結孔hに位置合わせできない問題が生じ、いずれの場合も、所要の連結を行うことができないことになってしまう。そのため従来の連結構造によるときは、連結孔hの位置決めとその加工を極めて精度よく行わなければならない慎重さと熟練を要し、縁無し眼鏡の製造能率が悪く又製造コストの上昇を招く問題があった。そして時には、連結孔hの孔明けに失敗して高価なレンズが不良品となる不経済もあった。前記連結孔は、小売店で明けられるのが通常であるが、このような困難な問題は、小売店にとって非常に深刻であったのである。

【0006】(3) 更に、ブリッジ部材の連結部やテンブルの連結部が、レンズ側面への当接片を具えるものとして構成されていたため、該連結部を形成するに際して、複数種類の小さな部品を所要にロウ付けする作業を要し、その製造に工数を要して生産性が悪い問題があった。又複数箇所をロウ付けして連結部が形成されていたため、テンブルの開き具合などを調整する際に連結部を

曲げたとき、ロウ離れを起こす恐れがあった。加えて、テンブルの開き具合を調整するに際して、連結部を屈曲させた際、その屈曲が不適當であると、レンズ側面が当接片によって局部的に無理に押圧されてその部分に大きな応力が作用し、これが原因してレンズ欠けやレンズ割れが生ずる恐れがあった。

【0007】(4) 加えて従来の連結構造によるときは、図24に示すように、前記連結ネジkがレンズの後面(顔面側)に突出することになったため、この突出部分qが邪魔になってレンズを拭きにくい問題があったばかりか、眼鏡着用状態において眼鏡が物に当たった場合、該突出部分qで目を損傷する危険もあった。又レンズの後面(顔面)にネジ軸が突出し、又該ネジ軸に樹脂ワッシャやナットが取付けられることから、このような突出部が眼鏡の見栄えを損なう問題もあった。

【0008】本発明は、かかる問題点を解決し得る縁無し眼鏡の提供を目的とするものである。

【0009】

【課題を解決するための手段】前記課題を解決するため、本発明は以下の手段を採用する。即ち本発明に係る縁無し眼鏡は、左右のプラスチック製レンズの内側の縁部分相互をブリッジで連結すると共に、前記レンズの外側の縁部分にヨロイの端部分を連結してなる縁無し眼鏡であって、前記ブリッジの端部分及び／又は前記ヨロイの端部分には、外周に突部が設けられた連結軸が突設され、該連結軸が、レンズの縁部分に設けられた取付孔に押し込まれている。そして前記突部が、加熱により軟化せしめられてその後硬化した、取付孔の内周部分に埋設され、該連結軸の抜け止めと回り止めが図られていることを特徴とするものである。

【0010】この場合前記突部は、前記連結軸の押し込み方向で見て、その前側の突出量をその後側の突出量よりも小さく設定するのがよい。

【0011】又本発明に係る縁無し眼鏡の他の態様は、左右のプラスチック製レンズの内側の縁部分相互をブリッジで連結すると共に、前記レンズの外側の縁部分にヨロイの端部分を連結してなる縁無し眼鏡であって、前記ブリッジの端部分及び／又は前記ヨロイの端部分には、外周に凹部が設けられた連結軸が突設され、該連結軸が、レンズの縁部分に設けられた取付孔に押し込まれている。そして、加熱により軟化せしめられた取付孔の内周部分のプラスチックが前記凹部に入り込んで硬化され、該連結軸の抜け止めと回り止めが図られていることを特徴とするものである。

【0012】前記各縁無し眼鏡において前記レンズは、前記取付孔を設ける部分を他の部分よりも弾力性を有する柔軟部として形成するのがよい。

【0013】連結軸が突部を有する前記縁無し眼鏡において、前記レンズは、前記取付孔を設ける部分を他の部分よりも弾力性を有する柔軟部として形成し、該柔軟部

は、前記突部が埋設される内部を柔軟に形成し、且つ表面部と裏面部を硬質に形成するのがよい。

【0014】連結軸が凹部を有する前記縁無し眼鏡において、前記レンズは、前記取付孔を設ける部分を他の部分よりも弾力性を有する柔軟部として形成し、該柔軟部は、前記凹部が位置せしめられる内部を柔軟に形成し、且つ表面部と裏面部を硬質に形成するのがよい。

【0015】前記各縁無し眼鏡において、前記取付孔は、底部を具えた盲孔として形成し、該盲孔に前記連結軸を押し込むのがよい。

【0016】又前記各縁無し眼鏡において、前記取付孔は、レンズの前側面(眼鏡着用者の顔面に面する側と反対側)が塞がれた底部を有し且つ後端が開放する盲孔として形成し、又前記連結軸は、該盲孔の後端開口より押し込み、該連結軸の前端面が前記底部に押し付けられた状態とし、前記連結軸の前端面に設けられた装飾が前記盲孔の透明な底部を透かしてレンズの前側面から視認できるように構成するのがよい。

【0017】又前記各縁無し眼鏡において、前記端部分は、前記取付孔に前記連結軸を押し込んだ際に該取付孔の周辺部分が熱変形で歪んだ場合、該歪んだ周辺部分を覆い隠す大きさに形成するのがよい。

【0018】本発明に係る縁無し眼鏡の製造方法は、左右のプラスチック製レンズの内側の縁部分相互をブリッジで連結すると共に、前記レンズの外側の縁部分にヨロイの端部分を連結してなる縁無し眼鏡の製造方法であって、前記ブリッジの端部分及び／又は前記ヨロイの端部分は、外周に突部が設けられた連結軸が突設されたものとなし、該連結軸を、前記レンズの縁部分に設けられた取付孔に押し込み、該押し込みの際に前記取付孔の内周部分を熱で軟化せしめ、該軟化した内周部分に前記突部を埋設状態とし、その後における前記内周部分の硬化によって前記連結軸の抜け止めと回り止めを図ることを特徴とするものである。

【0019】又本発明に係る縁無し眼鏡の他の製造方法は、左右のプラスチック製レンズの内側の縁部分相互をブリッジで連結すると共に、前記レンズの外側の縁部分にヨロイの端部分を連結してなる縁無し眼鏡の製造方法であって、前記ブリッジの端部分及び／又は前記ヨロイの端部分は、外周に凹部が設けられた連結軸が突設されたものとなし、該連結軸を、前記レンズの縁部分に設けられた取付孔に押し込み、該押し込みの際に前記取付孔の内周部分を熱で軟化せしめ、該軟化した内周部分のプラスチックを前記凹部に入り込ませ、その後における前記内周部分及び前記入り込んだプラスチックの硬化によって、前記連結軸の抜け止めと回り止めを図ることを特徴とするものである。

【0020】又本発明に係る縁無し眼鏡の他の製造方法は、左右のプラスチック製レンズの内側の縁部分相互をブリッジで連結すると共に、前記レンズの外側の縁部分

にヨロイの端部分を連結してなる縁無し眼鏡の製造方法であって、前記ブリッジの端部分及び／又は前記ヨロイの端部分は、外周に凹部が設けられた連結軸が突設されたものとなし、又、前記レンズの縁部分には、内周部分の所要部位に内面突部を有した取付孔が設けられたものとなし、該連結軸を前記取付孔に押し込み、該押し込みの際に前記内面突部を熱で軟化せしめ、該軟化したプラスチックを前記凹部に入り込ませ、その後における前記内周部分及び前記入り込んだプラスチックの硬化によって、前記連結軸の抜け止めと回り止めを図ることを特徴とするものである。

【0021】前記各製造方法において、前記取付孔が、底部を具えた盲孔である場合、該底部側の直径を他の部分よりも小さく形成することによって、直径の小さい該部分を前記内面突部とするのがよい。

【0022】前記各製造方法において、前記連結軸を予め加熱して前記取付孔に押し込み、該押し込みの際に、前記取付孔の内周部分を前記連結軸が帯有する熱で軟化せしめるのがよい。

【0023】又前記各製造方法において、前記取付孔の所要部位に内面突部を設けると共に、前記連結軸を予め加熱して前記取付孔に押し込み、該押し込みの際に前記内面突部を前記連結軸が帯有する熱で軟化せしめ、該軟化したプラスチックを前記凹部に入り込ませるのがよい。

【0024】又前記各製造方法において、前記連結軸に超音波振動を付与しながら該連結軸を前記取付孔に押し込み、該押し込みの際に、前記取付孔の内周部分を前記超音波振動により発生した摩擦熱で軟化せしめるのがよい。

【0025】

【発明の実施の形態】〔第1の実施の形態〕図1、図2において本発明に係る縁無し眼鏡1は、左右のプラスチック製レンズ2、2の内側の縁部分3、3相互をブリッジ5で連結すると共に、前記レンズ2、2の外側の縁部分6、6にヨロイ7を連結してなるものである。

【0026】前記レンズ2、2の内側の縁部分3及び外側の縁部分6には、例えば図3～4、図5～6に示すように取付孔10、10、10、10が設けられている。又図1～2、図4、図6に示すように、前記ブリッジ5の両端部分11、11には、外周12に突部13が設けられた連結軸15、15が突設されており、又図1～2、図3、図5に示すように、前記ヨロイ7の端部分16にも、外周12に突部13が設けられた連結軸15が突設されている。

【0027】前記連結軸15は、前記取付孔10に押し込まれるものであり、図7に示すその前端面17に着色や凹凸模様等の装飾が施されており、該連結軸の周方向に、例えば図7～8、図12に示すように、90度の角度ピッチで前記突部13が突設されている。該突部13

は、連結軸のの外周から、最大で例えば0.15mm程度突出しており、前記連結軸の押し込み方向で見て、その前側19の突出量がその後側20の突出量よりも小さく設定されている。

【0028】又前記レンズ2は、その全体が柔軟な弾力性を有するプラスチック素材を以て形成されたり、前記取付孔10を設ける部分が、柔軟な弾力性を有するプラスチック素材を以て形成されるのが好ましい。

【0029】該取付孔10を設ける部分を柔軟な弾力性を有する素材を以て形成する態様の一つとしては、例えば図9に示すように、視力矯正の機能を果たすレンズ本体21は従来と同様の硬質のプラスチック素材を以て形成すると共に、その周囲部分22の全体を柔軟な弾力性を有する素材を以て形成し、該レンズ本体21と該周囲部分（柔軟部22a）22とをつなぎ目のない状態で一連に形成するものを挙げることができる。なお図9においては説明の便宜上、符号23を以てつなぎ目を実線で示している。或いは例えば図10に示すように、視力矯正の機能を果たす硬質のプラスチック素材からなるレンズ本体25の、前記取付孔を設ける部分を開口し、該開口部分26に、柔軟な弾力性を有する素材からなる透明プラスチックの板状片（例えば1cm程度の直径を有するもの）27を嵌め込み、該板状片27とレンズ本体25とを、つなぎ目のない状態で一連に形成し、該板状片27が柔軟部27aを形成するように構成するもの等を挙げることができる。なお図10においては説明の便宜上、符号28を以てつなぎ目を実線で示している。前記柔軟部22a、27aは例えば図11に示すように、内部29が柔軟に形成され且つその前面部30及び後面部31が、前記レンズ本体21、25と同程度に硬い硬質部として形成されることもある。

【0030】前記取付孔10は本実施の形態においては、例えば図12に示すように、レンズの後面で開放し且つレンズの前面側に底部32を有する盲孔として形成されている。

【0031】そして前記連結軸15は、図12に矢印で示す方向に、前記盲孔としての取付孔10の後端開口35を通して該取付孔10に押し込まれており、図13に示すように、該連結軸15に設けられた前記突部13が、加熱により軟化せしめられその後硬化してなる、取付孔の内周部分36に埋設され、且つ連結軸の前端面17が前記底部32に押し付けられ、これにより、連結軸15の抜け止めと回り止めが図られている。レンズ2が図11に示す構成であるときは、突部13が柔軟な内部29に埋設状態とされる。

【0032】該連結軸15の押し込みは、該連結軸15をヒーターで所定温度に加熱して後、これを前記取付孔10に押し込む。なおこの加熱温度は、取付孔10の内周部分36を軟化させ得るように、レンズ素材との関係で設定されるものであり、例えば150～250℃程度

に設定される。この押し込みの際に、該取付孔10の内周部分36を前記連結軸15の帶有する熱で軟化せしめ、軟化した内周部分36に前記突部13を埋設状態とする。該突部13の埋設は、前記のように、その前側19の突出量がその後側20の突出量よりも小さく設定されているために、該軟化した内周部分36に無理なく進入して行われることになる。その後における内周部分36の硬化により、前記突部13がアンカー部となって前記連結軸15の抜け止めと回り止めが図られることになる。

【0033】そしてこの状態で、前記連結軸15の前端面17に設けた着色や凹凸模様等の装飾が、前記取付孔の透明な底部32を透かして視認され、レンズがワンポイント的に装飾されることとなる。該底部32を、例えば図2に示すようにレンズ2の前面側（眼鏡着用者の顔面に面する側と反対側）に設けるときは、レンズの前面側をワンポイント的に装飾できて特に好ましい。

【0034】左右のレンズ2、2が、このようにしてブリッジ5で連結され且つヨロイに連結されることにより、図1や図2に示す縁無し眼鏡1が構成される。該縁無し眼鏡1にあっては、ブリッジ5の端部分に突設された連結軸15とヨロイ7の端部分に突設された連結軸15が、抜け止めと回り止めが図られてレンズ2に確実に連結されているため、従来のツーポイント眼鏡と同様の機能を発揮する。

【0035】特に本実施の形態においては、取付孔10が、底部32を有する盲孔33として形成されているため、該底部32を具える側のレンズ面34には、図13に示すように何らの突出がないため、レンズの拭き取りを障害なく行うことができる。又前記レンズ2が、柔軟な弾力性を有するプラスチック素材を以て形成されたり、或いは取付孔10を設ける部分が柔軟な弾力性を有するプラスチック素材を以て形成されるときは、テンブルの開閉等に際して連結軸15に回転方向の力が作用したり引き抜き方向の力が作用したときも、これに柔軟に対応でき、レンズに負担をかけにくい利点がある。

【0036】〔第2の実施の形態〕図14は、本発明に係る縁無し眼鏡1の他の態様を示すものであり、前記とは逆に、連結軸15に凹部37が設けられている。前記と同様の盲孔33としての取付孔10には、予め加熱された連結軸15が押し込まれており、加熱により軟化せしめられた取付孔10の内周部分36のプラスチックが、符号38で示すように前記凹部37に入り込んで硬化され、該連結軸15の抜け止めと回り止めが図られている。前記連結軸15に設ける凹部37は、図15に示すように、連結軸の同方向に連続した凹溝状に形成されることその他、図16に示すように、連結軸の同方向に間隔を置いて設けられた窪み部として形成されることもある。

【0037】加熱により軟化せしめられた前記内周部分

36のプラスチックを前記凹部37に容易に入り込ませるために、本実施の形態においては、前記取付孔10の直径を前記連結軸15の直径よりも若干小さく形成して該取付孔10に連結軸15を押し込むことその他、例えば図17に示すように、取付孔10の入口側の直径は前記連結軸15の直径と略等しく形成する一方、前記底部32側の直径は稍小さくして内面突部39を形成し、加熱状態の連結軸15を前記取付孔10に押し込み、前記内面突部39（前記内周部分36）を、連結軸15の帶有する熱で軟化せしめ、該軟化したプラスチックを前記凹部37に入り込ませるのがよい。

【0038】〔第3の実施の形態〕図18は、本発明に係る縁無し眼鏡1のその他の態様を示すものであり、前記レンズ2の内側の縁部分3及び外側の縁部分6に設ける取付孔10が貫通孔として形成されている。そして該取付孔10に押し込まれた連結軸15の先端40が、レンズ2の後面41又は前面42（図18においては後面41）に若干突出するように構成され、該連結軸15の外周12に設けられた突部13が、前記と同様の要領によって、加熱により軟化せしめられてその後硬化した取付孔の内周部分36に埋設され、該連結軸15の抜け止めと回り止めが図られている。

【0039】〔第4の実施の形態〕図19は、本発明に係る縁無し眼鏡1のその他の態様を示すものであり、前記レンズ2の内側の縁部分3及び外側の縁部分6に設ける取付孔10が貫通孔として形成されている。

【0040】前記連結軸15の外周12には凹部37が設けられており、該連結軸15が前記と同様の要領により取付孔10に押し込まれることにより、加熱により軟化せしめられた取付孔の内周部分36のプラスチックが、符号38で示すように前記凹部37に入り込んで硬化され、該連結軸15の抜け止めと回り止めが図られている。該連結軸15に設ける凹部37の形態は、第2の実施の形態で説明したところと同様である。

【0041】この場合は例えば図20に示すように、前記取付孔10を、レンズの前面側からと後面側からドリル加工により形成し、取付孔10の長さ方向の例えば中央部分に内面突部39を形成することとし、ヒータにより加熱された連結軸15を該取付孔10に押し込むことにより、該連結軸15の帶有する熱で軟化せしめられた前記内面突部39（前記内周部分36）を前記凹部37に入り込ませるのがよい。

【0042】〔その他の実施の形態〕

(1) 前記連結軸に設ける突部は、前記連結軸を取付孔に押し込むことに困難性がなく、且つ、硬化した取付孔の内周部分に突部が埋設された状態で前記連結軸の抜け止めと回り止めを達成できるものであれば、その大きさや形状、配置状態、個数は所要に設定することができる。又、凹部との組み合わせで突部が設けられることもある。

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【0043】(2) 本発明に係る縁無し眼鏡の製造方法において、連結軸を取付孔に押し込む工程は、該連結軸をヒーターで予め加熱してこれを取付孔に押し込むことその他、連結軸に超音波振動を付与しながら押し込み、該押し込みの際に発生する摩擦熱で取付孔の内周部分を軟化させながら行うこともできる。更には、高周波を利用して取付孔の内周部分を熱で軟化させながら連結軸を押し込むこともできる。

【0044】(3) 前記連結軸は、前記ブリッジの端部分やヨロイの端部分に一体に突設されることその他、例えば図21～22に示すように、ブリッジ5の端部分11やヨロイ7の端部分16に設けた挿通孔43を挿通する、頭部45付きの軸体46を以て構成されることもある。この場合、該軸体46と前記挿通孔43とが、凹凸係合や接着やロウ付等により互いに回り止めされたものとし、該端部分11、16から突出する部分を連結軸15とする。図21～22においては、前記挿通孔43に、軸体46に設けた係合突部47と嵌合し得る係合凹部49を設けてなり、該係合凹部49に、前記係合突部47と突部13を通過させつつ、前記軸体46を挿通孔43に挿通させることができる。

【0045】(4) 前記連結軸は、レンズの素材よりも硬質であって、ブリッジの端部分やヨロイの端部分をレンズに確実に連結できるものであれば、金属製のものには特定されない。例えば、酸化チタン等を樹脂に混ぜ合わせて形成した硬質素材等を以て構成することも考えられる。

【0046】(5) 本発明に係る縁無し眼鏡は、そのブリッジの端部分のみ、又はヨロイの端部分のみに前記連結軸が突設され、該連結軸15が、前記と同様にして取付孔10に固定されることもある。

【0047】

【発明の効果】本発明は以下の如き優れた効果を採用する。

(1) 本発明に係る縁無し眼鏡は、ブリッジの端部分及び／又はヨロイの端部分に、突部又は凹部が外周に設けられた連結軸が突設され、該連結軸が、レンズの縁部分に設けられた取付孔に押し込まれている。そして、加熱により軟化せしめられてその後硬化した、取付孔の内周部分に前記突部が埋設され、或いは、加熱により軟化せしめられた取付孔の内周部分のプラスチックが前記凹部に入り込んで硬化され、これらにより、該連結軸の抜け止めと回り止めが図られている。従って本発明によるときは、レンズの表裏に配置した樹脂パッキンを弾性圧縮状態にして、ブリッジやヨロイの連結部をレンズにネジ固定する従来の縁無し眼鏡における場合のような、表裏の樹脂パッキンの弾性劣化に伴う連結部の緩み発生の恐れがなく、ブリッジやヨロイがレンズに確実に抜け止め且つ回り止めされて連結された、安定構造の縁無し眼鏡を提供できることになる。そして、取付孔への連結軸の

押し込みは、取付孔の内周部分を熱で軟化させて行うものであり、レンズに設けた取付孔にそのまま連結軸を圧入するものではないため、突部を具える連結軸であっても、これを障害なく押し込むことができる。特に前記突部が、その前側の突出量がその後側の突出量よりも小さく設定されるときは、該突部を、加熱によって軟化した内周部分に無理なく進入させることができると共に、その後における内周部分の硬化により、前記突部をアンカー部として機能させ、前記連結軸の抜け止めと回り止めを確実に図り得ることとなる。又このように、レンズに対するブリッジやヨロイの連結を簡易に行うことができ、従来のような、小さな固定ネジとナットとを用いてブリッジやヨロイをレンズに固定しなければならないといった手間のかかる面倒な作業を必要としないため、小売店等における眼鏡組立作業の能率化を達成でき、眼鏡の組立コストを低減させ得る。

【0048】(2) 本発明は、従来のように、ブリッジの端部分やヨロイの端部分を固定ネジを用いてレンズに連結する構成ではなく、該端部分に突設された連結軸を、レンズに設けた取付孔に押し込む構成であるため、該連結軸は、ブリッジやヨロイをレンズに所要に連結できる限り、極力細く形成することもできる。その結果ブリッジやヨロイも細く形成できることとなり、縁無し眼鏡をそのファッション性を考慮してスリムに構成することができる。

【0049】(3) 本発明によるときは、レンズに対するブリッジやヨロイの連結を、取付孔の内周部分を熱で軟化させて連結軸を押し込むという簡易な作業工程を経ることによって行うことができるため、小さな固定ネジとナットとを用いてブリッジやヨロイをレンズに固定しなければならないといった手間のかかる面倒な作業を必要とせず、小売店等における眼鏡組立作業の能率化を達成でき、眼鏡の組立コストを低減させ得る。

【0050】(4) 特に本発明において、前記取付孔が盲孔として形成されるときは、底部を有する側のレンズ面が図13に示すように平滑となる。従って従来の縁無し眼鏡におけるように、ネジ軸部がレンズの後面等に突出し、且つ該突出したネジ軸部にワッシャやナット等が取付けられた状態となって眼鏡の見栄えを損なうといった問題を解消でき、縁無し眼鏡に斬新なデザインを付与し得ることとなる。

【0051】(5) 特に、前記取付孔を、底部を有する盲孔として形成する場合は、該底部を有する側のレンズ面が図13に示すように平滑となるために、レンズを拭きやすい利点がある。又この場合、連結軸の前端面を底部に押し付けることとし、該前端面に着色や凹凸模様等の装飾を付す場合は、該着色や凹凸模様を、透明な底部を透かしてレンズの前面側から視認できることになり、眼鏡にワンポイント的な装飾効果を付与することができる。更に、取付孔をこのように盲孔として形成する場合



は、該取付孔の端部にゴミ等が付着するのを防止できる。

【0052】(6) 前記取付孔を、底部を有する盲孔として形成する場合において、前記連結軸に凹部を設けるときは、前記底部側に内面突部を設けておくことにより、熱で軟化した突部の流動性によってプラスチックを前記凹部に入り込ませることが容易となる。

【0053】(7) 又、前記取付孔を貫通孔として形成する場合において、前記連結軸に凹部を設けると、前記貫通孔の軸線方向の中間部分の内周部分に内面突部を形成する場合は、該連結軸を押し込む際の熱による前記内面突部の流動性により、プラスチックを前記凹部に入り込ませることが容易となる。

【0054】(8) 又前記のように、内周部分への突部の埋設や、凹部へのプラスチックへの入り込みによって、ブリッジやヨロイをレンズに回り止めされた状態で連結できるため、従来の縁無し眼鏡における回り止め用の当接片を省略できることになる。従って、取付孔の形成位置を、従来におけるほど精度よく行うことは必要でなく、その位置が多少狂ったとしても、連結軸をレンズに所要に連結できることになる。これにより、小売店における縁無し眼鏡の組立て作業を容易とするだけでなく、取付孔の形成位置の間違いによって高価なレンズを不良品とする不経済も発生させない。

【0055】(9) レンズの、取付孔を設ける部分を他の部分よりも弾力性を有する柔軟部として構成する場合は、眼鏡を着用する際等においてテンブルを開いたときに、前記連結軸に回転方向の力が作用したり引抜き方向の力が作用した場合も、該柔軟部の弾力性によってこれを吸収でき、取付孔の周辺にクラック等が発生するのを抑制できるため、レンズに負担をかけにくい利点がある。

【0056】(10)ブリッジの端部分やヨロイの端部分の大きさを、取付孔の周辺部分を覆い隠す大きさに設定するときは、取付孔に連結軸を押し込んだ際に、該取付孔の周辺部分に歪みが発生したときも、該歪んだ周辺部分を覆い隠して、ブリッジやヨロイのレンズに対する連結部分を見栄えよく処理できることになる。

【図面の簡単な説明】

【図1】本発明に係る縁無し眼鏡を示す斜視図である。

【図2】本発明に係る縁無し眼鏡の他の態様を示す斜視図である。

【図3】レンズの外側の縁部分とヨロイの端部分の構成を説明する斜視図である。

【図4】レンズの内側の縁部分とブリッジの端部分の構成を示す斜視図である。

【図5】レンズの外側の縁部分とヨロイの端部分の構成を示す斜視図である。

【図6】レンズの内側の縁部分とブリッジの端部分の構成を示す斜視図である。

【図7】ヨロイの端部分に突設された連結軸を示す斜視図である。

【図8】連結軸に突設した突部を示す断面図である。

【図9】柔軟部を具えたレンズを示す斜視図である。

【図10】柔軟部を具えたレンズの他の態様を示す斜視図である。

【図11】柔軟部を具えたレンズのその他の態様を示す部分断面図である。

10 【図12】レンズに設けた盲孔に連結軸を押し込む工程を説明する断面図である。

【図13】レンズに設けた盲孔に連結軸を押し込んだ状態を示す断面図である。

【図14】レンズに設けた盲孔に連結軸を押し込んだ他の態様を示す断面図である。

【図15】凹部を具える連結軸を示す斜視図である。

【図16】凹部を具える連結軸の他の態様を示す斜視図である。

【図17】凹部を具える連結軸を盲孔に押し込む工程を説明する断面図である。

20 【図18】レンズに設けた貫通孔に連結軸を押し込んだ状態を示す断面図である。

【図19】凹部を具える連結軸を、レンズに設けた貫通孔に押し込んだ状態を示す断面図である。

【図20】凹部を具える連結軸を、レンズに設けた貫通孔に押し込む工程を説明する断面図である。

【図21】連結軸の他の構成を説明する斜視図である。

【図22】その連結軸を介してテンブルをレンズに連結した状態を示す斜視図である。

【図23】従来の縁無し眼鏡を示す正面図である。

30 【図24】その部分断面図である。

【符号の説明】

1 縁無し眼鏡

2 レンズ

3 内側の縁部分

6 外側の縁部分

7 ヨロイ

10 取付孔

11 ブリッジの端部分

13 突部

40 15 連結軸

16 ヨロイの端部分

17 連結軸の前端面

21 レンズ本体

22 a 柔軟部

25 レンズ本体

27 a 柔軟部

29 内部

30 前面部

31 後面部

50 32 底部

15

16

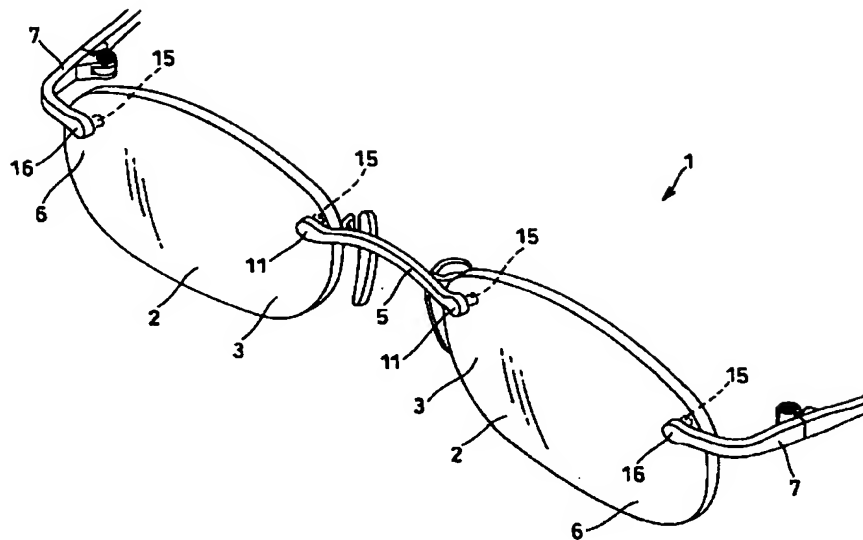
36 取付孔の内周部分

\* 39 内面突部

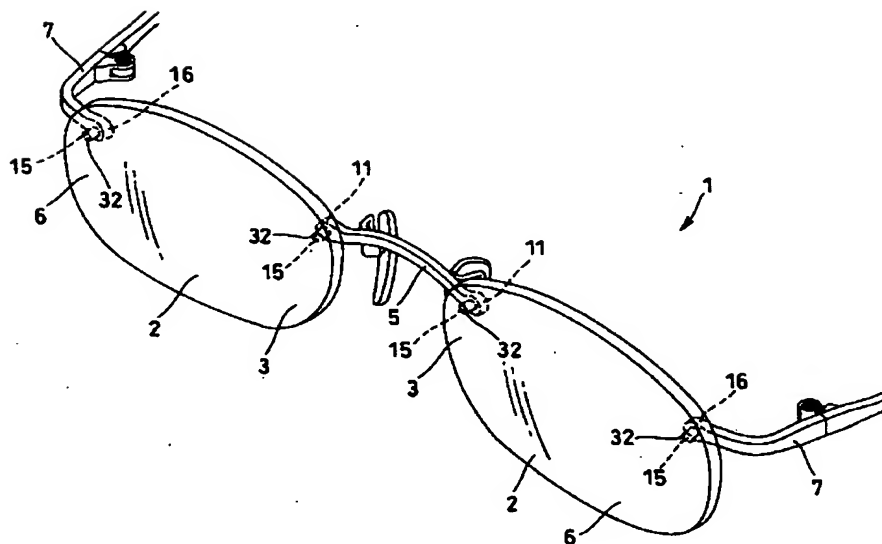
37 連結軸の凹部

\*

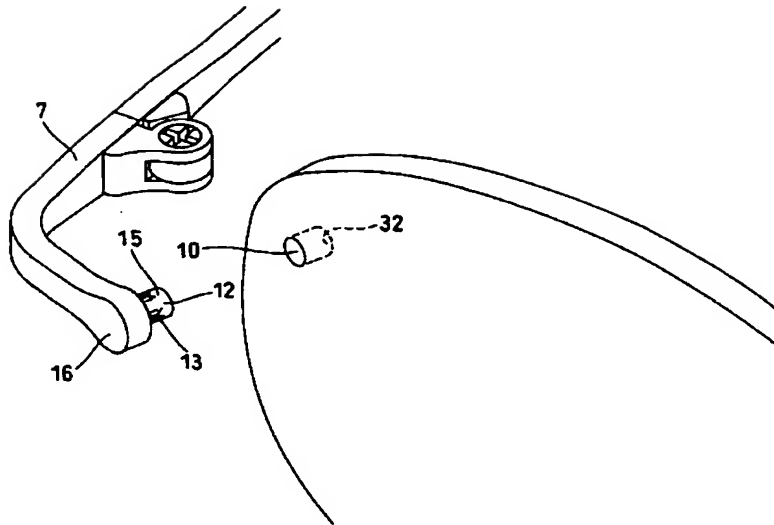
【図1】



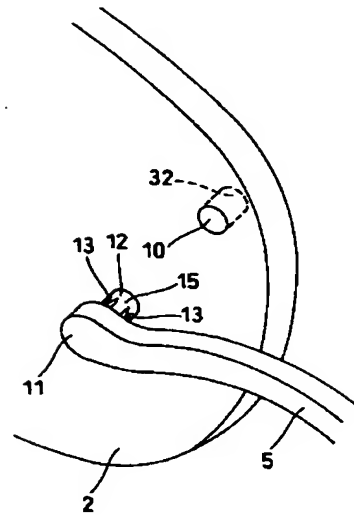
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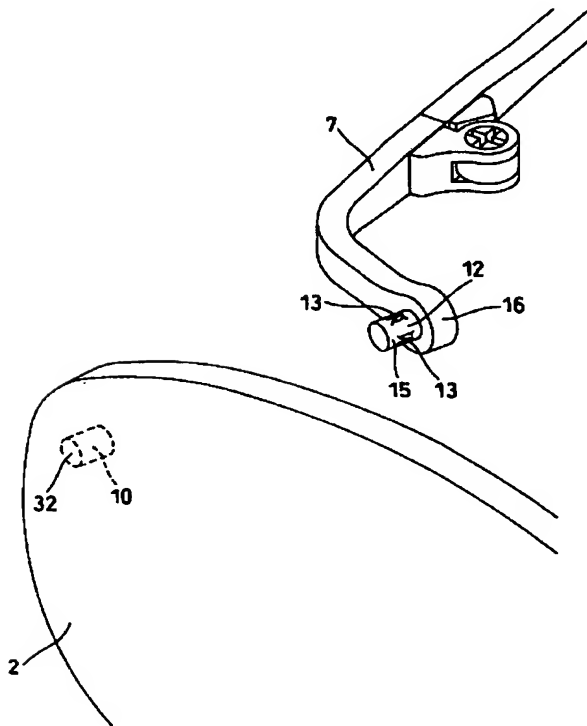
【図3】



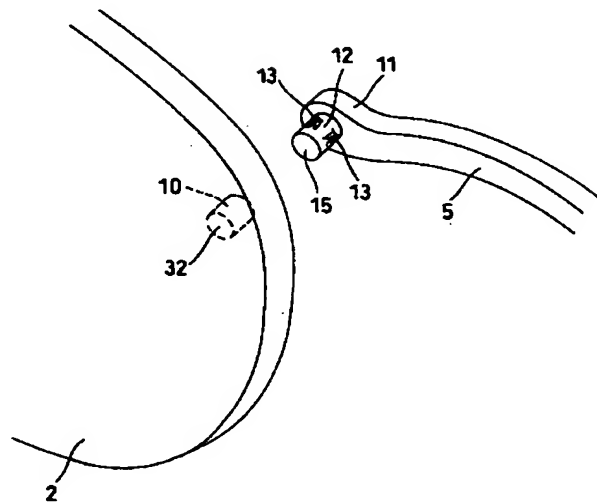
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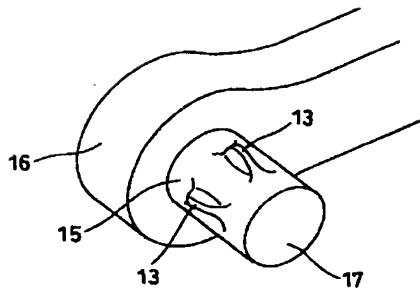
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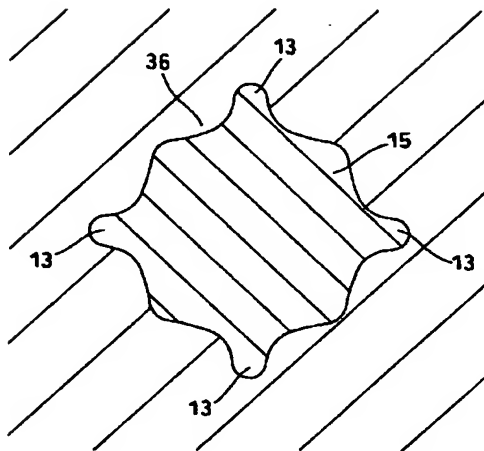
【図6】



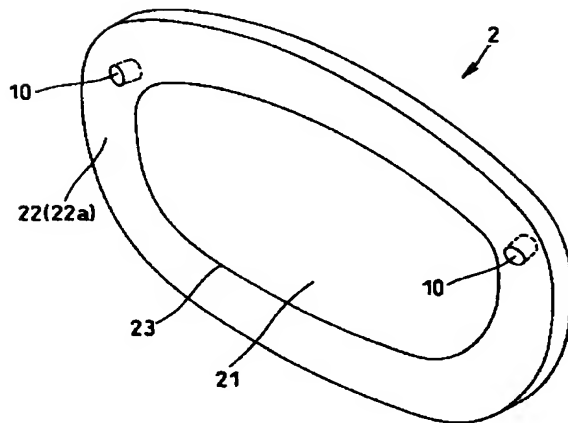
【図7】



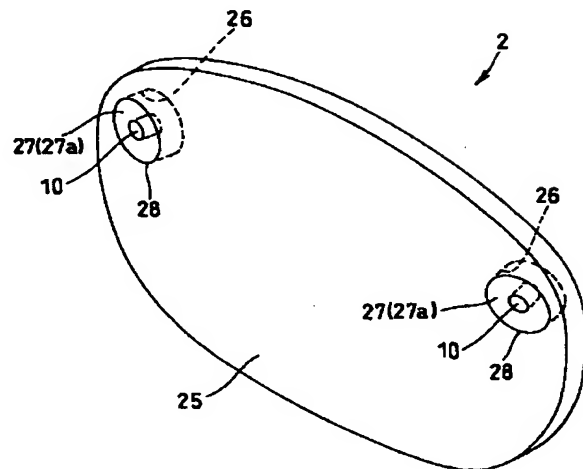
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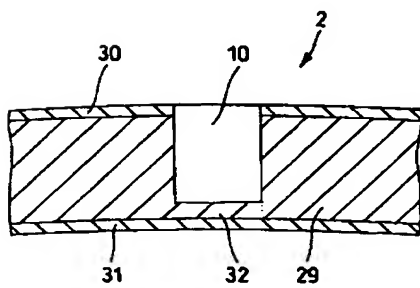
【図9】



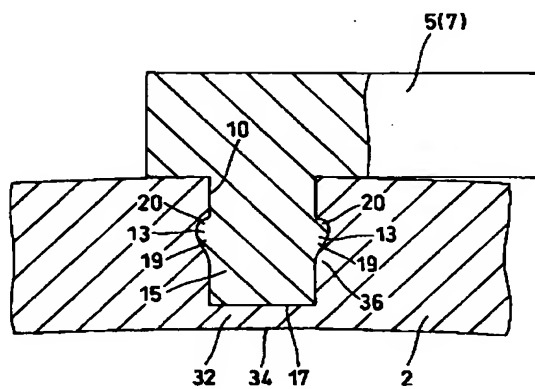
【図10】



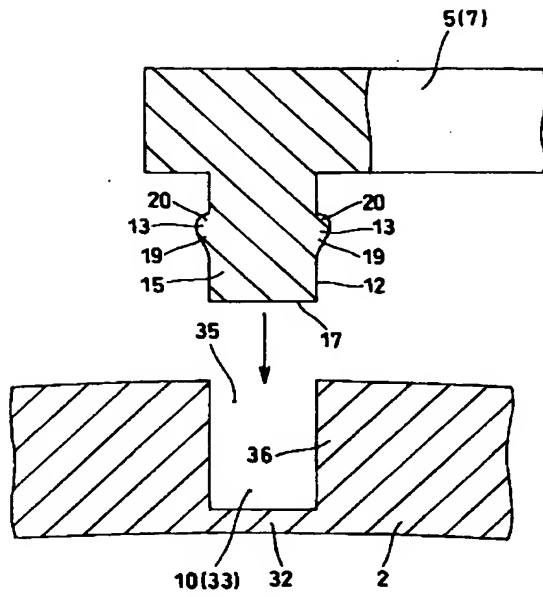
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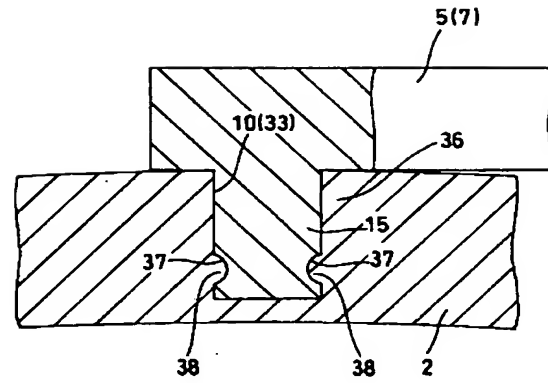
【図13】



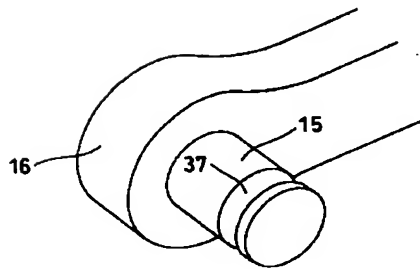
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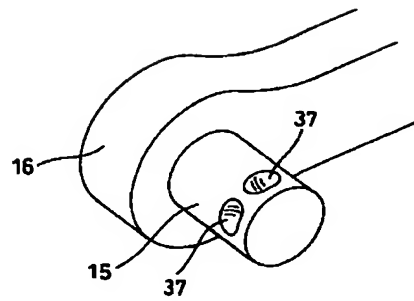
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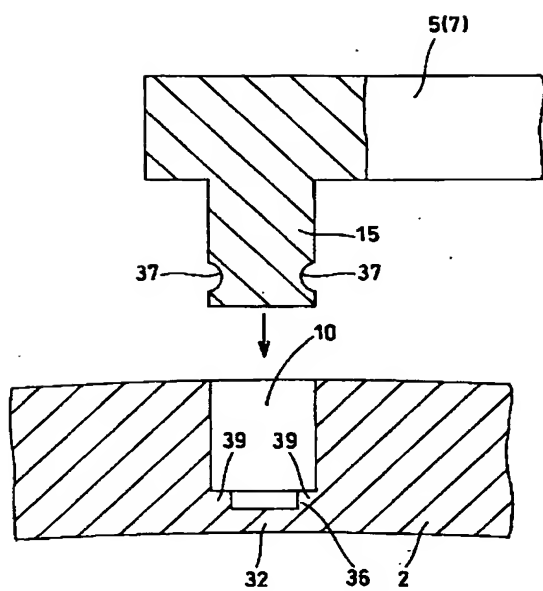
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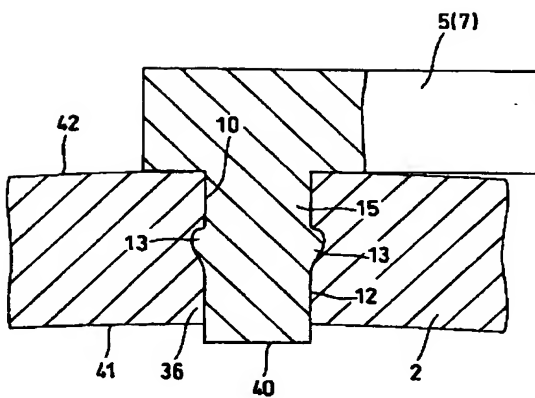
【図16】



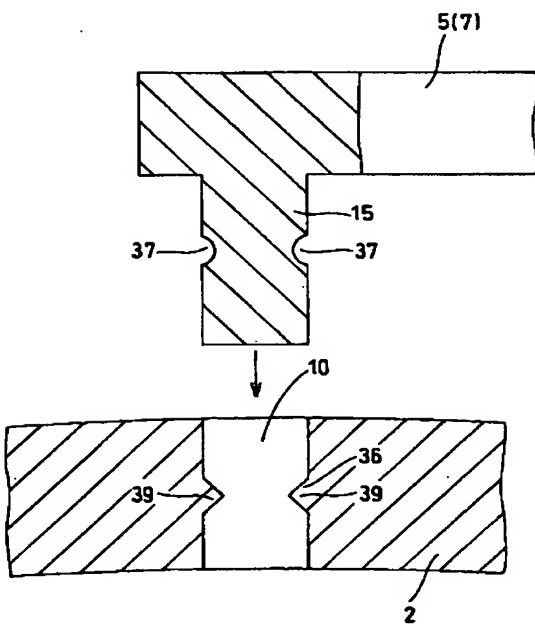
【図17】



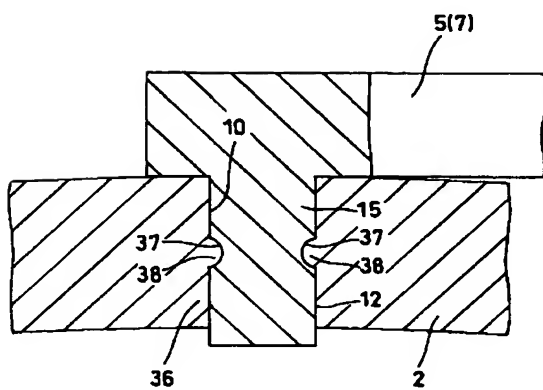
【図18】



【図20】

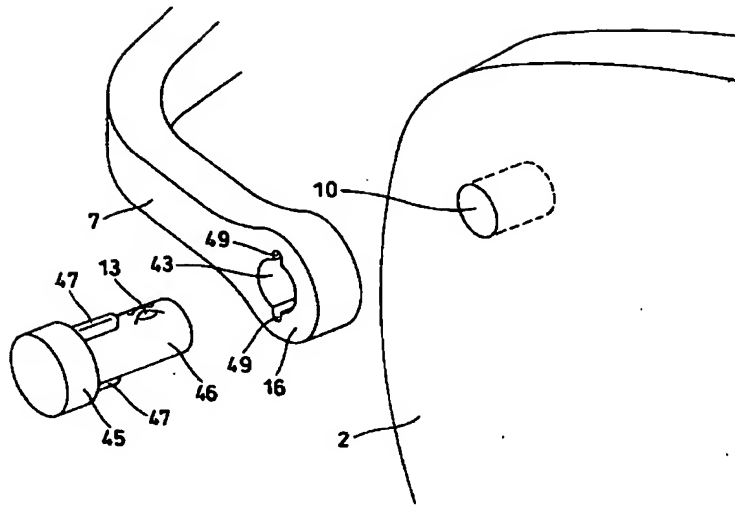


【図19】

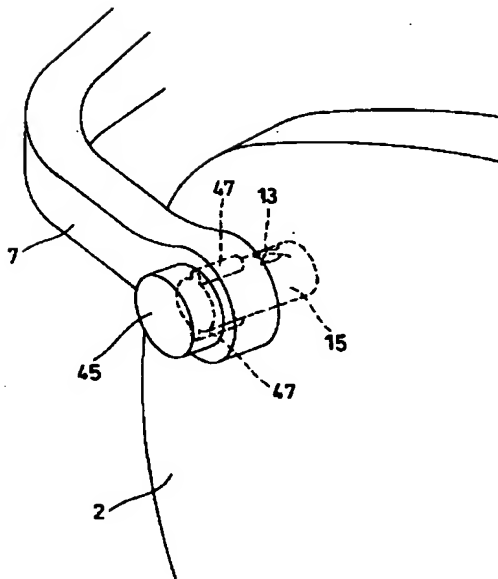




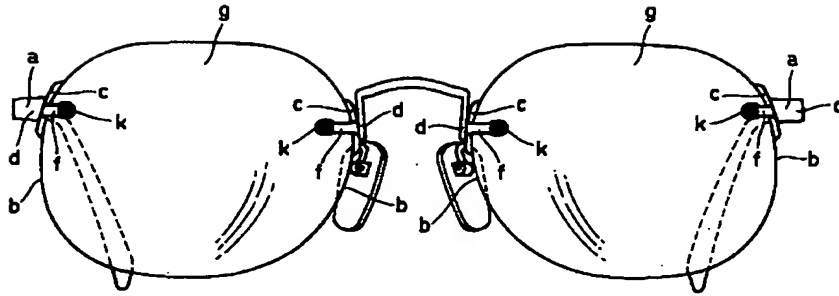
【図21】



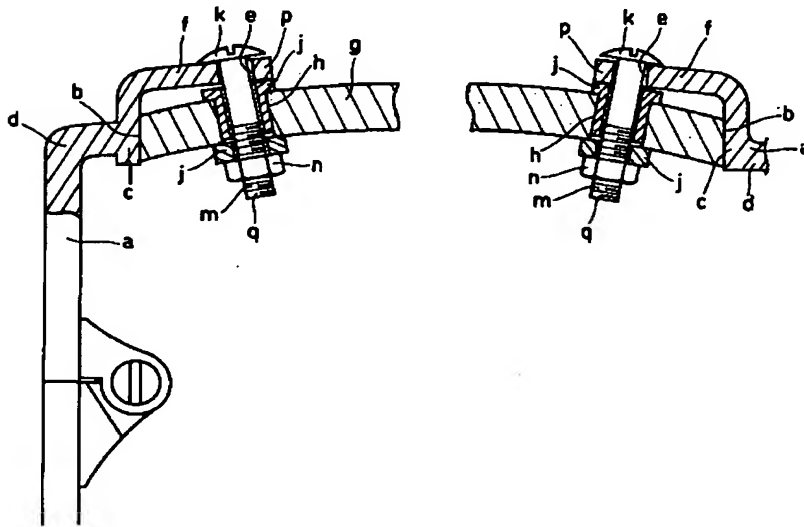
【図22】



【図23】



【図24】



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1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. \*\*\*\* shows the word which can not be translated.
3. In the drawings, any words are not translated.

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CLAIMS

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[Claim(s)]

[Claim 1] While connecting both [ inside the lens made from plastics on either side ] edge parts on a bridge In the edge-less glasses which come to connect the edge part of YOROI with a part for the edge of the outside of said lens into the edge part of said bridge, and/or the edge part of said YOROI The connecting shaft with which the projected part was prepared in the periphery protrudes, and this connecting shaft is stuffed into the mounting hole established in a part for the edge of a lens. The edge-less glasses characterized by being laid under the inner circumference part of a mounting hole which said projected part was made to soften with heating, and hardened after that, and for this connecting shaft falling out, and planning the stop and the baffle.

[Claim 2] While connecting both [ inside the lens made from plastics on either side ] edge parts on a bridge In the edge-less glasses which come to connect the edge part of YOROI with a part for the edge of the outside of said lens into the edge part of said bridge, and/or the edge part of said YOROI The connecting shaft with which the crevice was established in the periphery protrudes, and this connecting shaft is stuffed into the mounting hole established in a part for the edge of a lens. The edge-less glasses characterized by for the plastics of the inner circumference part of the mounting hole you were made to soften with heating entering said crevice, hardening it, and for this connecting shaft falling out, and planning the stop and the baffle.

[Claim 3] Said projected parts are edge-less glasses according to claim 1 characterized by seeing in the pushing direction of said connecting shaft, and setting up smaller than the amount of protrusions by the side of after that the amount of protrusions by the side of before [ the ].

[Claim 4] Said lenses are edge-less glasses according to claim 1, 2, or 3 with which the part which prepares said mounting hole is characterized by being formed as the flexible section which has resiliency rather than other parts.

[Claim 5] This flexible section is edge-less glasses according to claim 1 characterized by forming flexibly the interior under which said projected part is laid by forming said lens as the flexible section in which the part which prepares said mounting hole has resiliency rather than other parts, and forming the surface section and a flesh-side surface part in hard.

[Claim 6] They are the edge-less glasses according to claim 2 characterized by forming said lens as the flexible section in which the part which prepares said mounting hole has resiliency rather than other parts, and forming flexibly the interior you are made for this flexible section to be located in said crevice inside, and forming the surface section and a flesh-side surface part in hard.

[Claim 7] Said mounting holes are edge-less glasses according to claim 1 to 6 which are the foramen cecum ossis forntalis equipped with the pars basilaris ossis occipitalis, and are characterized by stuffing said connecting shaft into this foramen cecum ossis forntalis.

[Claim 8] Said mounting hole is foramen cecum ossis forntalis which has the pars basilaris ossis occipitalis with which the front-face side (the side and the opposite side facing a glasses wearer's face) of a lens was closed, and the back end opens. Said connecting shaft The edge-less glasses according to claim 1 to 7 characterized by being pushed in from back end opening of this foramen cecum ossis forntalis, and being in the condition that the front end side of this connecting shaft was forced on said pars basilaris ossis occipitalis, and for the ornament by which it was prepared in the front end side of said connecting shaft spacing the transparent pars basilaris ossis occipitalis of said foramen cecum ossis forntalis, and being able to check by looking from the front-face side of a lens.

[Claim 9] said edge part is this \*\*\*\*, when said connecting shaft is stuffed into said mounting hole and the

circumference part of this mounting hole is distorted by heat deformation -- the edge-less glasses according to claim 1 to 8 characterized by being formed in the magnitude which covers a circumference part.

[Claim 10] While connecting both [ inside the lens made from plastics on either side ] edge parts on a bridge It is the manufacture approach of the edge-less glasses which come to connect the edge part of YOROI with a part for the edge of the outside of said lens. The edge part of said bridge, and/or the edge part of said YOROI That on which the connecting shaft with which the projected part was prepared in the periphery protruded, nothing, and this connecting shaft Push into the mounting hole established in a part for the edge of said lens, and said projected part is made into a laying-under-the-ground condition at the inner circumference part which was made to soften the inner circumference part of said mounting hole with heat, and was this softened on the occasion of this pushing. The manufacture approach of the edge-less glasses characterized by for said connecting shaft falling out and planning a stop and a baffle by hardening of said inner circumference part which can be set after that.

[Claim 11] While connecting both [ inside the lens made from plastics on either side ] edge parts on a bridge It is the manufacture approach of the edge-less glasses which come to connect the edge part of YOROI with a part for the edge of the outside of said lens. The edge part of said bridge, and/or the edge part of said YOROI That on which the connecting shaft with which the crevice was established in the periphery protruded, nothing, and this connecting shaft Push into the mounting hole established in a part for the edge of said lens, and the inner circumference part of said mounting hole is made to soften with heat in the case of this pushing. The manufacture approach of the edge-less glasses characterized by making the plastics of the softened this inner circumference part enter said crevice, and for said connecting shaft falling out by hardening of said inner circumference part which can be set after that, and said plastics which entered, and planning a stop and a baffle.

[Claim 12] While connecting both [ inside the lens made from plastics on either side ] edge parts on a bridge It is the manufacture approach of the edge-less glasses which come to connect the edge part of YOROI with a part for the edge of the outside of said lens. The edge part of said bridge, and/or the edge part of said YOROI To a part for that on which the connecting shaft with which the crevice was established in the peripheral face protruded, nothing, and the edge of said lens Nothing [ by which the mounting hole with an inside projected part was established in the necessary part of an inner circumference part / the thing and nothing ], By hardening of said inner circumference part which the plastics which stuffed this connecting shaft into said mounting hole, was made to soften said inside projected part with heat in the case of this pushing, and was this softened is made to enter said crevice, and can set it after that, and said plastics which entered The manufacture approach of the edge-less glasses characterized by for said connecting shaft falling out and planning a stop and a baffle.

[Claim 13] The manufacture approach of the edge-less glasses according to claim 12 characterized by using this part with a small diameter as said inside projected part by forming smaller than other parts the diameter by the side of this pars basilaris ossis occipitalis when said mounting hole is foramen cecum ossis forntalis equipped with the pars basilaris ossis occipitalis.

[Claim 14] The manufacture approach of the edge-less glasses according to claim 10, 11, 12, or 13 characterized by making it soften with the heat with which said connecting shaft is beforehand heated, it pushes into said mounting hole, and said connecting shaft \*\*\*\* the inner circumference part of said mounting hole in the case of this pushing.

[Claim 15] The manufacture approach of the edge-less glasses according to claim 11, 12, or 13 characterized by making the plastics which heated said connecting shaft beforehand, stuffed into said mounting hole, was made to soften with the heat with which said connecting shaft \*\*\*\* said inside projected part in the case of this pushing, and was this softened enter said crevice while preparing an inside projected part in the necessary part of said mounting hole.

[Claim 16] The manufacture approach of the edge-less glasses according to claim 10, 11, 12, or 13 characterized by stuffing this connecting shaft into said mounting hole, giving supersonic vibration to said connecting shaft, and making the inner circumference part of said mounting hole soften with the frictional heat generated by said supersonic vibration in the case of this pushing.

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[Translation done.]

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- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.\*\*\* shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

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DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the edge-less glasses called the so-called two point glasses which connect the edge part of a bridge, and the edge part of YOROI with a lens. It is related with the edge-less glasses which stuff in more detail the connecting shaft which a bridge and the edge part of YOROI have into the mounting hole established in the lens, and it comes to fix.

[0002]

[Description of the Prior Art] As for this connection structure in the edge-less glasses called the so-called two point glasses of a configuration of having connected with a part for the edge of the outside of a lens the edge part of YOROI prepared in the tip side of Temple while connecting the edge part of a bridge with a part for a edge inside a lens, having been constituted as follows conventionally was common.

[0003] That is, said edge part a carried out low attachment of the piece f of connection by which the insertion hole e was formed in the way side among lens sides at a part for a projection and a toe at said piece c of contact, and was constituted while it carried out low attachment of the curved piece c of contact which contacts the lens side face b at the edge of the connection section body d, as shown in drawing 23 -24. And in order to connect the connection section a of this configuration with Lens g As shown in drawing 24 , while making the resin washer j intervene and inserting the connection screw k in the communicating pore h prepared in this lens g from the end By equipping with the resin washer j the screw shank m of the lens of this connection screw k which projects in a side on the other hand, and screwing and binding Nut n tight into the part projected from this resin washer j It bound tight so that elastic deformation of the resin washers j and j of said table flesh side might be carried out to necessary, and this was fixing said connection section a to Lens g. And in this fixed condition, the baffle of said connection section a was planned according to an engagement operation of said piece c of contact which is in a contact condition on the lens side face b.

[0004]

[Problem(s) to be Solved by the Invention] However, there were the following troubles in these conventional edge-less glasses.

(1) A means to connect with Lens g the trouble aforementioned connection section a which slack tends to produce in the connection section Although the resin washers j and j were made to be placed between the front backgrounds of said communicating pore and being carried out by binding said nut n tight so that the elastic compression set of this resin washer may be carried out to necessary in order for Part p and Nut n by the side of the tip of the piece c of connection to prevent damaging a lens side The resin washers j and j in elastic pressure contracted state had the problem which resin gets used to the original bolting strength, and the resiliency deteriorates, consequently a backlash generates in the connection section, when the elastic pressure contracted state continued for a while. Thus, when a backlash occurred, conventionally, bound said nut n tight further, said resin washers j and j were made to produce necessary elastic compression again, and this had canceled the backlash. However, since the elasticity of this resin washer tends to deteriorate easily again, the dissolution of a backlash will be merely temporary and a backlash will occur again. thus, when it becomes, Nut n is refastened again, but while repeating bolting of such a nut, said resin washer becomes hard gradually, among those it will be alike, and will be crushed and the backlash dissolution by bolting of a nut will already become impossible.

[0005] (2) Moreover, when based on said conventional connection structure, it faced forming communicating pore h in Lens g, and according to the distance between said pieces c of contact and insertion holes e,

communicating pore h needed to be positioned with a sufficient precision, and it needed to break. When the formed communicating pore is too close to the edge of Lens g, said piece c of contact stops contacting the lens side face b correctly, and the applicable contact piece c can demonstrate a necessary baffle operation. If the problem which a backlash generates in connection structure arises and communicating pore f is too far conversely from the edge of Lens g, after the piece c of contact has contacted the lens side face b The problem which cannot carry out alignment of the insertion hole e of said piece f of connection to communicating pore h arises, and necessary connection can be performed also when it is any. Therefore, when based on the conventional connection structure, the prudence and skill which must perform positioning and processing of communicating pore h with a very sufficient precision were required, and there was a problem to which the manufacture efficiency of edge-less glasses invites the rise of a manufacturing cost bad again. and -- the time -- the hole of communicating pore h -- there was also non-economy from which dawn goes wrong and an expensive lens serves as a defective. Although said communicating pore usually ended at the retail store, such a difficult problem was very serious for the retail store.

[0006] (3) Since the connection section of a bridge member and the connection section of Temple were furthermore constituted as a thing equipped with the piece of contact to a lens side face, it faced forming this connection section, the activity which carries out low attachment of two or more kinds of small components necessary was required, the manufacture took the man day, and there was a problem that productivity was bad. Moreover, since low attachment of two or more places was carried out and the connection section was formed, when having adjusted the aperture condition of Temple etc. and the connection section was bent, there was a possibility of causing a low detached building. In addition, when it faced adjusting the aperture condition of Temple and the connection section was made crooked, the lens side face was locally pressed by force by the piece of contact as the crookedness is unsuitable, big stress acted on the part, and there was a possibility that this might result and a lens chip and a lens crack might arise.

[0007] (4) When were based on the conventional connection structure in addition and glasses hit an object in about [ that there was a problem with which this lobe part q becomes obstructive and cannot wipe a lens easily ], and a glasses wear condition since said connection screw k will project on the rear face (face side) of a lens as shown in drawing 24 , there was also risk of damage an eye in this lobe part q. Moreover, since a screw shaft is attached in the rear face (face) of a lens and the resin washer and the nut were attached in the projection and the \*\*\*\* screw shaft, the problem which spoils the appearance of glasses also had such a lobe.

[0008] This invention aims at offer of the edge-less glasses which can solve this trouble.

[0009]

[Means for Solving the Problem] In order to solve said technical problem, this invention adopts the following means. Namely, while the edge-less glasses concerning this invention connect both the edge parts inside the lens made from plastics on either side on a bridge It is the edge-less glasses which come to connect the edge part of YOROI with a part for the edge of the outside of said lens, and the connecting shaft with which the projected part was prepared in the periphery protrudes on the edge part of said bridge, and/or the edge part of said YOROI, and this connecting shaft is stuffed into the mounting hole established in a part for the edge of a lens. And it is characterized by being laid under the inner circumference part of a mounting hole which said projected part was made to soften with heating, and hardened after that, and for this connecting shaft falling out, and planning the stop and the baffle.

[0010] In this case, said projected part is good to see in the pushing direction of said connecting shaft, and to set up smaller than the amount of protrusions by the side of after that the amount of protrusions by the side of before [ that ].

[0011] Moreover, while other modes of the edge-less glasses concerning this invention connect both [ inside the lens made from plastics on either side ] edge parts on a bridge It is the edge-less glasses which come to connect the edge part of YOROI with a part for the edge of the outside of said lens, and the connecting shaft with which the crevice was established in the periphery protrudes on the edge part of said bridge, and/or the edge part of said YOROI, and this connecting shaft is stuffed into the mounting hole established in a part for the edge of a lens. And it is characterized by for the plastics of the inner circumference part of the mounting hole you were made to soften with heating entering said crevice, hardening it, and for this connecting shaft falling out, and planning the stop and the baffle.

[0012] In said each edge-less glasses, said lens is good to form the part which prepares said mounting hole as



the flexible section which has resiliency rather than other parts.

[0013] In said edge-less glasses with which a connecting shaft has a projected part, it is good for said lens to form the part which prepares said mounting hole as the flexible section which has resiliency rather than other parts, and for this flexible section to form flexibly the interior under which said projected part is laid, and to form the surface section and a flesh-side surface part in hard.

[0014] In said edge-less glasses with which a connecting shaft has a crevice, it is good for said lens to form the part which prepares said mounting hole as the flexible section which has resiliency rather than other parts, and for this flexible section to form flexibly the interior you are made to be located in said crevice, and to form the surface section and a flesh-side surface part in hard.

[0015] In said each edge-less glasses, said mounting hole is good to form as foramen cecum ossis forntalis equipped with the pars basilaris ossis occipitalis, and to stuff said connecting shaft into this foramen cecum ossis forntalis.

[0016] In said each edge-less glasses moreover, said mounting hole It forms as foramen cecum ossis forntalis which has the pars basilaris ossis occipitalis with which the front-face side (the side and the opposite side facing a glasses wearer's face) of a lens was closed, and the back end opens. Moreover, said connecting shaft It is good to constitute so that it pushes in from back end opening of this foramen cecum ossis forntalis, and it may consider as the condition that the front end side of this connecting shaft was forced on said pars basilaris ossis occipitalis, the ornament by which it was prepared in the front end side of said connecting shaft may space the transparent pars basilaris ossis occipitalis of said foramen cecum ossis forntalis and it can check by looking from the front-face side of a lens.

[0017] moreover, in said each edge-less glasses, said edge part is this \*\*\*\*, when said connecting shaft is stuffed into said mounting hole and the circumference part of this mounting hole is distorted by heat deformation -- it is good to form in the magnitude which covers a circumference part.

[0018] While the manufacture approach of the edge-less glasses concerning this invention connects both the edge parts inside the lens made from plastics on either side on a bridge It is the manufacture approach of the edge-less glasses which come to connect the edge part of YOROI with a part for the edge of the outside of said lens. The edge part of said bridge, and/or the edge part of said YOROI That on which the connecting shaft with which the projected part was prepared in the periphery protruded, nothing, and this connecting shaft Push into the mounting hole established in a part for the edge of said lens, and the inner circumference part of said mounting hole is made to soften with heat in the case of this pushing. Said projected part is made into a laying-under-the-ground condition at the softened this inner circumference part, and it is characterized by for said connecting shaft falling out and planning a stop and a baffle by hardening of said inner circumference part which can be set after that.

[0019] Moreover, other manufacture approaches of the edge-less glasses concerning this invention While connecting both [ inside the lens made from plastics on either side ] edge parts on a bridge It is the manufacture approach of the edge-less glasses which come to connect the edge part of YOROI with a part for the edge of the outside of said lens. The edge part of said bridge, and/or the edge part of said YOROI That on which the connecting shaft with which the crevice was established in the periphery protruded, nothing, and this connecting shaft Push into the mounting hole established in a part for the edge of said lens, and the inner circumference part of said mounting hole is made to soften with heat in the case of this pushing. It is characterized by for said connecting shaft falling out and planning a stop and a baffle by hardening of said inner circumference part which the plastics of the softened this inner circumference part is made to enter said crevice, and can set it after that, and said plastics which entered.

[0020] Moreover, other manufacture approaches of the edge-less glasses concerning this invention While connecting both [ inside the lens made from plastics on either side ] edge parts on a bridge It is the manufacture approach of the edge-less glasses which come to connect the edge part of YOROI with a part for the edge of the outside of said lens. The edge part of said bridge, and/or the edge part of said YOROI To a part for that on which the connecting shaft with which the crevice was established in the periphery protruded, nothing, and the edge of said lens Nothing [ by which the mounting hole with an inside projected part was established in the necessary part of an inner circumference part / the thing and nothing ], By hardening of said inner circumference part which the plastics which stuffed this connecting shaft into said mounting hole, was made to soften said inside projected part with heat in the case of this pushing, and was this softened is made to enter said

crevice, and can set it after that, and said plastics which entered It is characterized by for said connecting shaft falling out and planning a stop and a baffle.

[0021] In said each manufacture approach, when said mounting hole is foramen cecum ossis forntalis equipped with the pars basilaris ossis occipitalis, it is good by forming smaller than other parts the diameter by the side of this pars basilaris ossis occipitalis to use this part with a small diameter as said inside projected part.

[0022] In said each manufacture approach, it is good to make it soften with the heat with which said connecting shaft is beforehand heated, it pushes into said mounting hole, and said connecting shaft \*\*\*\* the inner circumference part of said mounting hole in the case of this pushing.

[0023] Moreover, in said each manufacture approach, while preparing an inside projected part in the necessary part of said mounting hole, it is good to make the plastics which heated said connecting shaft beforehand, stuffed into said mounting hole, was made to soften with the heat with which said connecting shaft \*\*\*\* said inside projected part in the case of this pushing, and was this softened enter said crevice.

[0024] Moreover, in said each manufacture approach, this connecting shaft is stuffed into said mounting hole, giving supersonic vibration to said connecting shaft, and it is good in the case of this pushing to make the inner circumference part of said mounting hole soften with the frictional heat generated by said supersonic vibration.

[0025]

[Embodiment of the Invention] [Gestalt of the 1st operation] The edge-less glasses 1 applied to this invention in drawing 1 and drawing 2 come to connect YOROI 7 with parts for the edge 6 and 6 of the outside of said lenses 2 and 2 while connecting a part for the edge 3 inside the lenses 2 and 2 made from plastics on either side, and both 3 on a bridge 5.

[0026] As shown in drawing 3 -4 and drawing 5 -6, mounting holes 10, 10, 10, and 10 are established in a part for a part for the edge 3 inside said lenses 2 and 2, and the outside edge 6. Moreover, as are shown in drawing 1 -2, drawing 4 , and drawing 6 , and the connecting shafts 15 and 15 with which the projected part 13 was formed in the periphery 12 protrude on parts for the both ends 11 and 11 of said bridge 5 and it is shown in drawing 1 -2, drawing 3 , and drawing 5 , the connecting shaft 15 with which the projected part 13 was formed in the periphery 12 protrudes also on the edge part 16 of said YOROI 7.

[0027] Said connecting shaft 15 is stuffed into said mounting hole 10, the ornament of coloring, a concavo-convex pattern, etc. is given to the front end side 17 shown in drawing 7 , and as shown in drawing 7 -8 and drawing 12 , said projected part 13 protrudes on the hoop direction of this connecting shaft in the include-angle pitch of 90 degrees. From the periphery of \*\*\*\*\*, this projected part 13 has projected about 0.15mm by max, for example, is seen in the pushing direction of said connecting shaft, and the amount of protrusions of before side 19 is set up smaller than the amount of protrusions of after that side 20.

[0028] moreover, the plastics material with which, as for said lens 2, the whole has flexible resiliency -- with -- \*\*\*\* -- the plastics material with which the part which is formed or forms said mounting hole 10 has flexible resiliency -- with, being formed is desirable.

[0029] the material which has flexible resiliency for the part which forms this mounting hole 10 -- with, the voice to form -- as one [ like ] for example, the hard plastics material as usual with the body 21 of a lens same as shown in drawing 9 which achieves the function of eyesight correction -- with, while forming the material which has flexible resiliency for the whole perimeter part 22 -- with, what forms and forms this body 21 of a lens and this perimeter part (flexible section 22a) 22 in a single string in the condition that there is no knot can be mentioned. in addition, drawing 9 -- setting -- explanation -- for convenience -- a sign 23 -- with -- \*\*\*\* -- the continuous line shows the knot. Or for example, the body 25 of a lens which consists of a hard plastics material which achieves the function of eyesight correction as shown in drawing 10 , Carry out opening of the part which prepares said mounting hole, and the tabular piece (for example, thing which has the diameter of about 1cm) 27 of the transparent plastic which consists of a material which has flexible resiliency is inserted in this opening part 26. What is constituted so that this tabular piece 27 and the body 25 of a lens may be formed in a single string in the condition that there is no knot and this tabular piece 27 may form flexible section 27a can be mentioned. in addition, drawing 10 -- setting -- explanation -- for convenience -- a sign 28 -- with -- \*\*\*\* -- the continuous line shows the knot. As said flexible sections 22a and 27a are shown in drawing 11 , the interior 29 may be formed flexibly and the front section 30 and the rear-face section 31 may be formed as said bodies 21 and 25 of a lens, and the hard section hard to the same extent.

[0030] In the gestalt of this operation, said mounting hole 10 is formed as foramen cecum ossis forntalis which

opens wide on the rear face of a lens, and has a pars basilaris ossis occipitalis 32 in the front-face side of a lens, as shown, for example in drawing 12.

[0031] And as said connecting shaft 15 is stuffed into drawing 12 in the direction shown by the arrow head at this mounting hole 10 through the back end opening 35 of the mounting hole 10 as said foramen cecum ossis forntalis and is shown in drawing 13 It is laid under the inner circumference part 36 of the mounting hole which said projected part 13 prepared in this connecting shaft 15 is made to soften with heating, and comes to harden after that, and the front end side 17 of a connecting shaft is forced on said pars basilaris ossis occipitalis 32, thereby, a connecting shaft 15 falls out and the stop and the baffle are planned. When a lens 2 is the configuration shown in drawing 11, it considers as a laying-under-the-ground condition to the interior 29 where a projected part 13 is flexible.

[0032] Pushing of this connecting shaft 15 heats this connecting shaft 15 to predetermined temperature at a heater, and stuffs this into said mounting hole 10 the back. In addition, whenever [ this stoving temperature ] is set up by relation with a lens material, and is set as about 150-250 degrees C so that the inner circumference part 36 of a mounting hole 10 may be softened. Said projected part 13 is made into a laying-under-the-ground condition at the inner circumference part 36 which was made to soften with the heat with which said connecting shaft 15 \*\*\*\* the inner circumference part 36 of this mounting hole 10, and was softened on the occasion of this pushing. Since the amount of protrusions of before side 19 is set up as mentioned above smaller than the amount of protrusions of after that side 20, laying under the ground of this projected part 13 will be performed into the this softened inner circumference part 36 by advancing reasonable. By hardening of the inner circumference part 36 which can be set after that, said projected part 13 turns into the support section, said connecting shaft 15 will fall out, and a stop and a baffle will be planned.

[0033] And in this condition, the ornament of a coloring, a concavo-convex pattern, etc. which were prepared in the front end side 17 of said connecting shaft 15 will space the transparent pars basilaris ossis occipitalis 32 of said mounting hole, and will be checked by looking, and a lens will be ornamented in one spot. As shown in drawing 2, when forming this pars basilaris ossis occipitalis 32 in the front-face side (the side and the opposite side facing a glasses wearer's face) of a lens 2, the front-face side of a lens can especially be ornamented in one spot, and it is desirable.

[0034] The edge-less glasses 1 shown in drawing 1 or drawing 2 are constituted by the lenses 2 and 2 on either side doing in this way, and connecting them on a bridge 5, and connecting them with YOROI. If it is in these edge-less glasses 1, since the connecting shaft 15 which protruded on the edge part of a bridge 5, and the connecting shaft 15 which protruded on the edge part of YOROI 7 fall out, a stop and a baffle are planned and it connects with the lens 2 certainly, the same function as the conventional two point glasses is demonstrated.

[0035] Especially in the gestalt of this operation, in the lens side 34 of the side equipped with this pars basilaris ossis occipitalis 32 since the mounting hole 10 is formed as foramen cecum ossis forntalis 33 which has a pars basilaris ossis occipitalis 32, since there is no protrusion as shown in drawing 13, a lens can be wiped off without a failure. moreover, the plastics material with which said lens 2 has flexible resiliency -- with -- \*\*\*\* -- the plastics material which has resiliency with the flexible part which is formed or forms a mounting hole 10 -- with, also when are formed, and the force of a hand of cut acts on a connecting shaft 15 or the force of the direction of drawing acts on it on the occasion of closing motion of Temple etc., it can respond to this flexibly and there is an advantage which cannot apply a burden to a lens easily.

[0036] [Gestalt of the 2nd operation] Drawing 14 shows other modes of the edge-less glasses 1 concerning this invention, and the crevice 37 is established in the connecting shaft 15 contrary to the above. The connecting shaft 15 heated beforehand is stuffed into the mounting hole 10 as the same foramen cecum ossis forntalis 33 as the above, said crevice 37 is entered, the plastics of the inner circumference part 36 of the mounting hole 10 you were made to soften with heating is hardened, as a sign 38 shows, this connecting shaft 15 falls out, and the stop and the baffle are planned. The crevice 37 established in said connecting shaft 35 is [0037] which the thing by which spacing was kept in this direction of a connecting shaft, and it was prepared in it, and which it becomes depressed and is formed as the section also has as shown in drawing 16 besides being formed in the shape of [ which continued in this direction of a connecting shaft ] a concave as shown in drawing 15. In the gestalt of this operation in order to make the plastics of said inner circumference part 36 you were made to soften with heating enter said crevice 37 easily As shown, others, for example, drawing 17, [ stuff / form the diameter of said mounting hole 10 small a little rather than the diameter of said connecting shaft 15, and / into this mounting

hole 10 / a connecting shaft 15 ] While the diameter of the entrance side of a mounting hole 10 spreads and forms the diameter of said connecting shaft 15, abbreviation, etc. the diameter by the side of said pars basilaris ossis occipitalis 32 -- \*\* -- it is good to make the plastics which made it small, formed the inside projected part 39, stuffed the connecting shaft 15 of a heating condition into said mounting hole 10, was made to soften with the heat with which a connecting shaft 15 \*\*\*\* said inside projected part 39 (said inner circumference part 36), and was this softened enter said crevice 37.

[0038] [Gestalt of the 3rd operation] Drawing 18 shows the mode of others of the edge-less glasses 1 concerning this invention, and the mounting hole 10 established in a part for a part for the edge 3 inside said lens 2 and the outside edge 6 is formed as a through tube. And the tip 40 of the connecting shaft 15 stuffed into this mounting hole 10 is constituted so that it may project a little in the rear face 41 or front face 42 (it sets to drawing 18 and is the rear face 41) of a lens 2. It is laid under the inner circumference part 36 of the mounting hole which the projected part 13 prepared in the periphery 12 of this connecting shaft 15 was made to soften with heating by the same point as the above, and hardened after that by it, this connecting shaft 15 falls out, and the stop and the baffle are planned.

[0039] [Gestalt of the 4th operation] Drawing 19 shows the mode of others of the edge-less glasses 1 concerning this invention, and the mounting hole 10 established in a part for a part for the edge 3 inside said lens 2 and the outside edge 6 is formed as a through tube.

[0040] The crevice 37 is established in the periphery 12 of said connecting shaft 15, when this connecting shaft 15 is stuffed into a mounting hole 10 by the same point as the above, said crevice 37 is entered, the plastics of the inner circumference part 36 of the mounting hole you were made to soften with heating is hardened, as a sign 38 shows, this connecting shaft 15 falls out, and the stop and the baffle are planned. The gestalt of the crevice 37 established in this connecting shaft 35 is the same as that of the place explained with the gestalt of the 2nd operation.

[0041] In this case, as shown, for example in drawing 20, said mounting hole 10 is formed by drilling from the rear-face side from the front-face side of a lens. The die-length direction of a mounting hole 10 for example, by supposing that the inside projected part 39 is formed in a central part, and stuffing into this mounting hole 10 the connecting shaft 15 heated at the heater It is good to make said inside projected part 39 (said inner circumference part 36) you were made to soften with the heat which this connecting shaft 15 \*\*\*\* enter said crevice 37.

[0042] [The gestalt of other operations]

(1) If said connecting shaft falls out where the projected part prepared in said connecting shaft does not have difficulty in stuffing said connecting shaft into a mounting hole and a projected part is laid under the inner circumference part of the hardened mounting hole, and a stop and a baffle can be attained, the magnitude and configuration, an arrangement condition, and the number can be set as necessary. Moreover, a projected part may be prepared in combination with a crevice.

[0043] (2) In the manufacture approach of the edge-less glasses concerning this invention, the process which stuffs a connecting shaft into a mounting hole is pushed in giving supersonic vibration to a connecting shaft besides heating this connecting shaft beforehand at a heater, and stuffing this into a mounting hole, and it can also be performed, softening the inner circumference part of a mounting hole with the frictional heat generated in the case of this pushing. Furthermore, a connecting shaft can also be pushed in, softening the inner circumference part of a mounting hole with heat using a RF.

[0044] (3) the axis 46 with head 45 which inserts in the insertion hole 43 prepared in the edge part 11 of a bridge 5, or the edge part 16 of YOROI 7 so that said connecting shaft may be shown in others [ protrude / at one / on the edge part of said bridge, or the edge part of YOROI ], drawing 21 -22 [ for example, ], -- with, it may be constituted In this case, the part into which the baffle of this axis 46 and said insertion hole 43 of each other should be carried out by concavo-convex engagement, adhesion, hard soldering, etc., and they project from these edge parts 11 and 16 is used as a connecting shaft 15. The insertion hole 43 can be made to insert said axis 46 in it in drawing 21 -22, coming to prepare the engagement projected part 47 prepared in the axis 46, and the engagement crevice 49 which can fit in in said insertion hole 43, and making this engagement crevice 49 pass said engagement projected part 47 and projected part 13 to it.

[0045] (4) If said connecting shaft is hard and the edge part of a bridge and the edge part of YOROI can be certainly connected with a lens rather than the material of a lens, it is not specified as a metal thing. for

example, the hard material which mixed titanium oxide etc. with resin and formed it -- with, constituting is also considered.

[0046] (5) Only in the edge part of the bridge, said connecting shaft protrudes only at the edge part of YOROI, and, as for the edge-less glasses concerning this invention, this connecting shaft 15 may be fixed to a mounting hole 10 like the above.

[0047]

[Effect of the Invention] This invention adopts the outstanding effectiveness like a less or equal.

(1) The connecting shaft with which the projected part or the crevice was established in the periphery protrudes on the edge part of a bridge, and/or the edge part of YOROI, and the edge-less glasses concerning this invention are stuffed into the mounting hole where this connecting shaft was prepared in a part for the edge of a lens. And the plastics of the inner circumference part of the mounting hole said projected part is laid under the inner circumference part of a mounting hole, or you were made to soften with heating which was made to soften with heating and was hardened after that enters said crevice, and is hardened, this connecting shaft falls out and the stop and the baffle are planned by these. Therefore, when based on this invention, resin packing arranged on the front reverse side of a lens is made into elastic pressure contracted state. Like the case in the conventional edge-less glasses which fix a bridge and the connection section of YOROI with screws to a lens There is no fear of slack generating of the connection section accompanying elastic degradation of resin packing of a front flesh side, and a bridge and YOROI will fall out certainly on a lens, and can offer a stop and the edge-less glasses of stable structure which the baffle was carried out and were connected. And pushing of the connecting shaft to a mounting hole makes it soften with heat, performs the inner circumference part of a mounting hole, and since it is not what presses a connecting shaft fit in the mounting hole established in the lens as it is, even if it is a connecting shaft equipped with a projected part, it can push this in without a failure. Said projected part will be operated as the support section by hardening of the inner circumference part which can be set after that while being able to make it advance without unreasonableness into the inner circumference part which softened this projected part with heating when the amount of protrusions by the side of before [ the ] was [ said especially projected part ] smaller than the amount of protrusions by the side of after that and it was set up, said connecting shaft will fall out, and a stop and a baffle can be planned certainly. Moreover, in this way, since a troublesome activity time-consuming [ "don't learn if connection of the bridge and YOROI to a lens can be performed simply and neither a bridge nor YOROI is fixed to a lens using the small fixed screw and small nut like before" ] is not needed, the promotion of efficiency of the glasses assembly operation in a retail store etc. can be attained, and the assembly cost of glasses may be reduced.

[0048] (2) Since this invention is a configuration stuffed into the mounting hole which prepared in the lens not the configuration that connects the edge part of a bridge, and the edge part of YOROI with a lens using a fixed screw but the connecting shaft which protruded on this edge part like before, this connecting shaft can also be thinly formed as much as possible, as long as a bridge and YOROI can be connected with a lens necessary. As a result, a bridge and YOROI can also be formed thinly and can constitute edge-less glasses slimly in consideration of the fashionability.

[0049] (3) Since it can carry out by passing through the simple routing of softening the inner circumference part of a mounting hole for connection of the bridge and YOROI to a lens with heat, and pushing in a connecting shaft when based on this invention, A troublesome activity time-consuming [ that a bridge and YOROI must be fixed to a lens using a small fixed screw and a small nut ] is not needed, but the promotion of efficiency of the glasses assembly operation in a retail store etc. can be attained, and the assembly cost of glasses may be reduced.

[0050] (4) Especially in this invention, when said mounting hole is formed as foramen cecum ossis forntalis, the lens side of the side which has a pars basilaris ossis occipitalis becomes smooth, as shown in drawing 13 . Therefore, it will be in the condition [ as / in the conventional edge-less glasses ] that the screw shank was attached in the rear face of a lens etc., and the washer, the nut, etc. were attached in the projection and the this projecting screw shank, the problem of spoiling the appearance of glasses can be solved, and a new design can be given to edge-less glasses.

[0051] (5) Since the lens side of the side which has this pars basilaris ossis occipitalis becomes smooth as shown in drawing 13 especially when forming said mounting hole as foramen cecum ossis forntalis which has a pars basilaris ossis occipitalis, there is an advantage which is easy to wipe a lens. Moreover, when it supposes

that the front end side of a connecting shaft is forced on a pars basilaris ossis occipitalis in this case and gives the ornament of coloring, a concavo-convex pattern, etc. to this front end side, a transparent pars basilaris ossis occipitalis will be spaced, this coloring and a concavo-convex pattern can be checked by looking from the front-face side of a lens, and the one spot ornament effectiveness can be given to glasses. Furthermore, when forming a mounting hole as foramen cecum ossis forntalis in this way, it can prevent that dust etc. adheres to the edge of this mounting hole.

[0052] (6) When forming said mounting hole as foramen cecum ossis forntalis which has a pars basilaris ossis occipitalis and establishing a crevice in said connecting shaft, it becomes easy by preparing the inside projected part in said pars-basilaris-ossis-occipitalis side to make plastics enter said crevice with the fluidity of the projected part softened with heat.

[0053] (7) Moreover, when forming said mounting hole as a through tube, establishing a crevice in said connecting shaft and forming an inside projected part in the inner circumference part of the interstitial segment of the direction of an axis of said through tube, it becomes easy with the fluidity of said inside projected part by the heat at the time of pushing in this connecting shaft to make plastics enter said crevice.

[0054] (8) moreover -- above -- laying under the ground of the projected part to an inner circumference part, and the plastics to a crevice -- entering -- since a bridge and YOROI can be connected where a baffle is carried out to a lens, the piece of contact for baffles in the conventional edge-less glasses can be omitted. Therefore, even if it is not required to perform the formation location of a mounting hole with a sufficient precision also in the former and the location is somewhat out of order, a connecting shaft can be connected with a lens necessary. The non-economy which uses an expensive lens as a defective by the mistake of the formation location of a mounting hole does not make it it not only to do easy the assembly activity of the edge-less glasses in a retail store by this, but generate, either.

[0055] (9) When it constitutes the part which prepares the mounting hole of a lens from other parts as the flexible section which has resiliency Also when wearing glasses and Temple is opened, the force of a hand of cut acts on said connecting shaft or the force of the direction of drawing acts This is absorbable with the resiliency of this flexible section, and since it can control that a crack etc. occurs around a mounting hole, there is an advantage which cannot apply a burden to a lens easily.

[0056] (10) it is this \*\*\*\*, also when setting the magnitude of the edge part of a bridge, or the edge part of YOROI as the magnitude which covers the circumference part of a mounting hole, a connecting shaft is stuffed into a mounting hole and distortion occurs into the circumference part of this mounting hole -- a circumference part will be covered and the joining segment to a bridge or the lens of YOROI can be processed well.

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[Translation done.]



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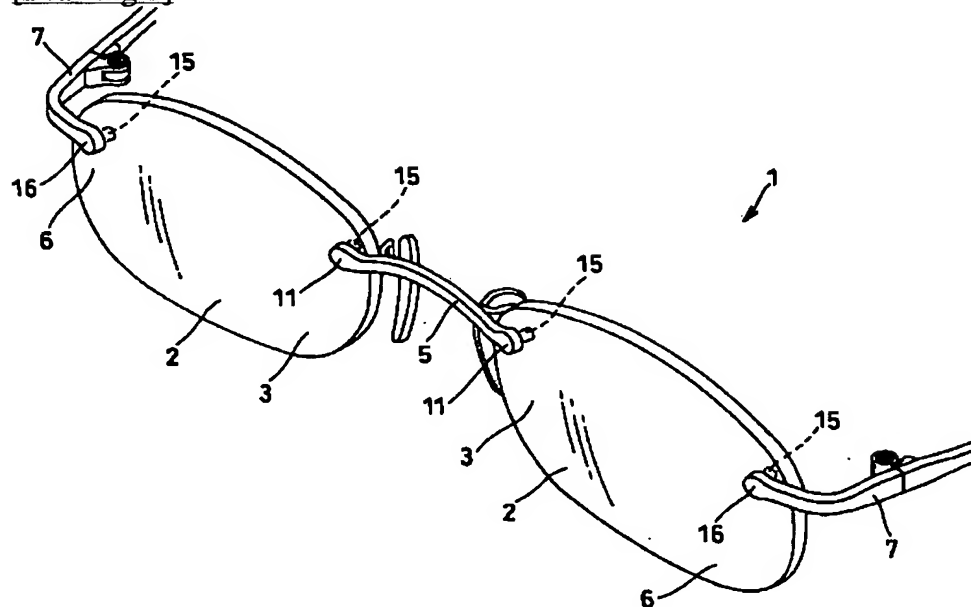
- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.\*\*\*\* shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

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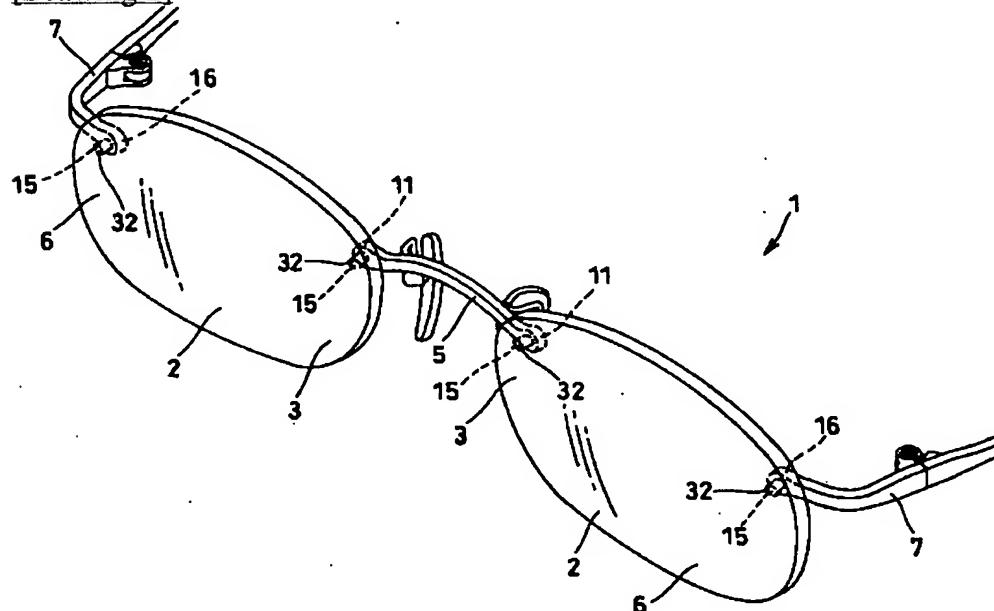
DRAWINGS

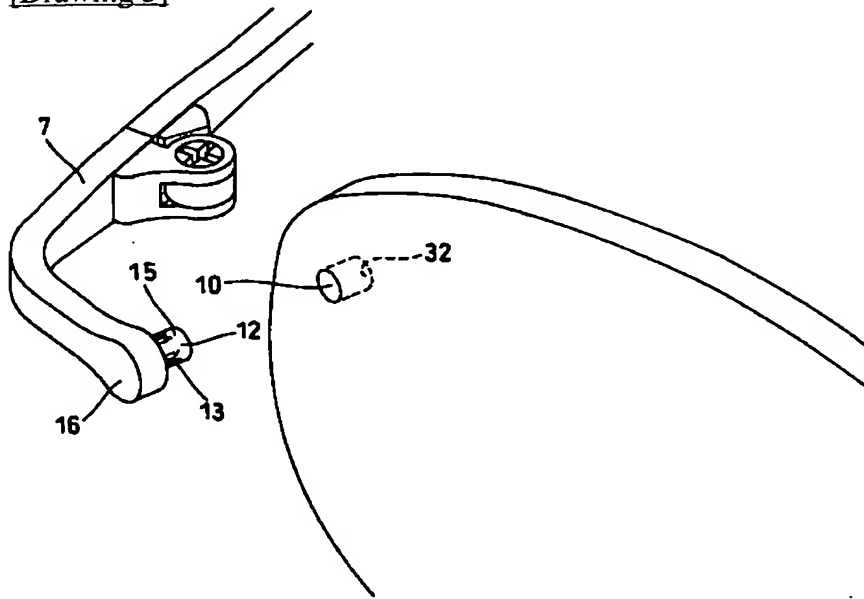
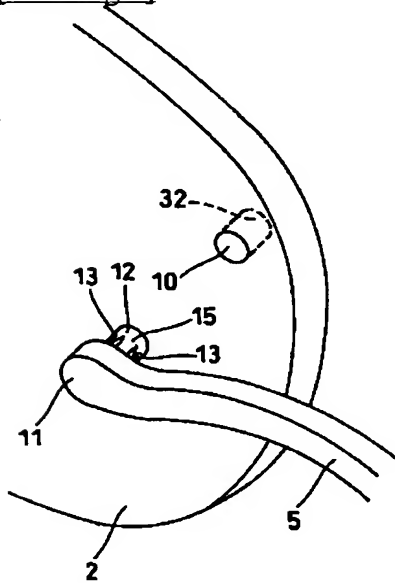
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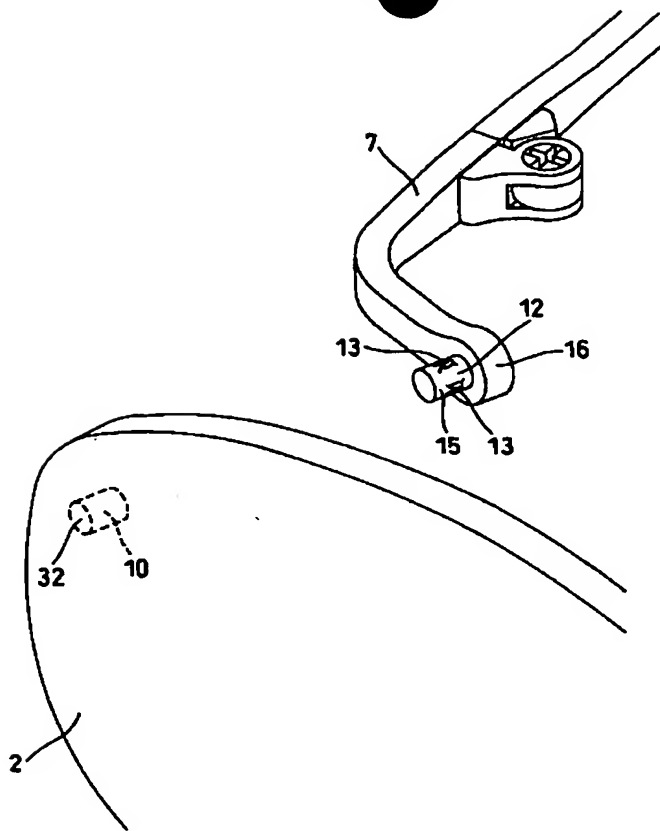
[Drawing 1]



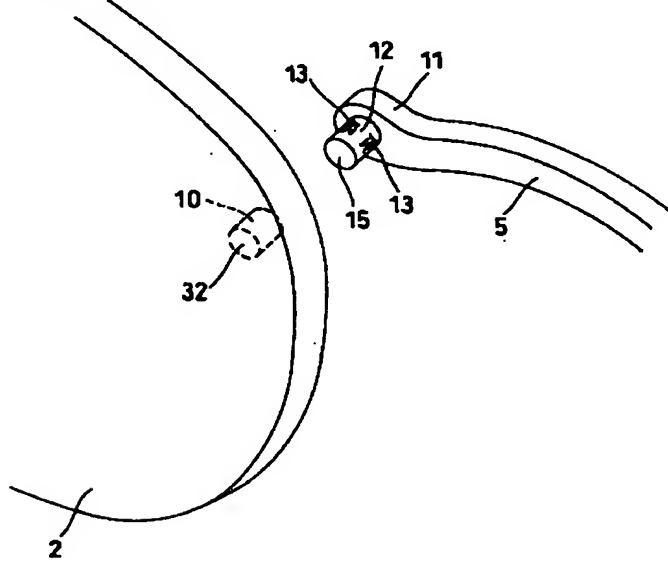
[Drawing 2]



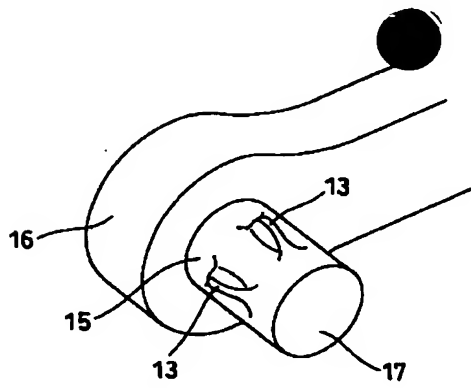
[Drawing 3][Drawing 4][Drawing 5]



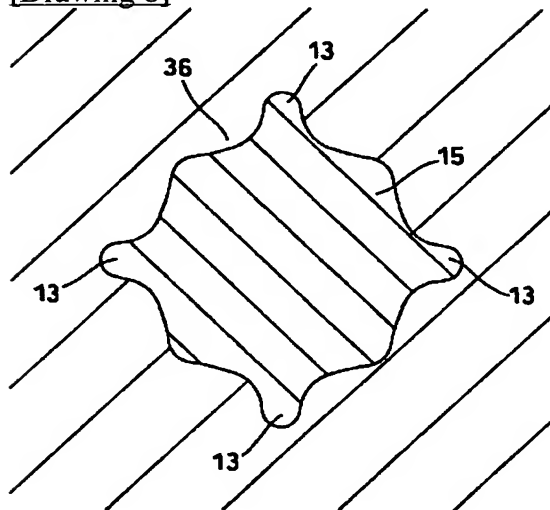
[Drawing 6]



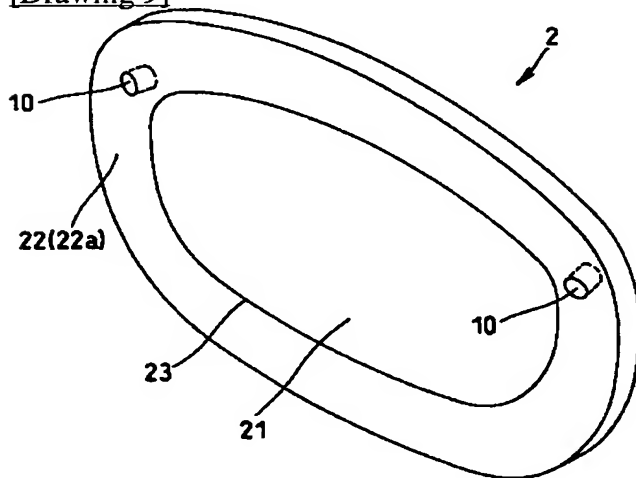
[Drawing 7]



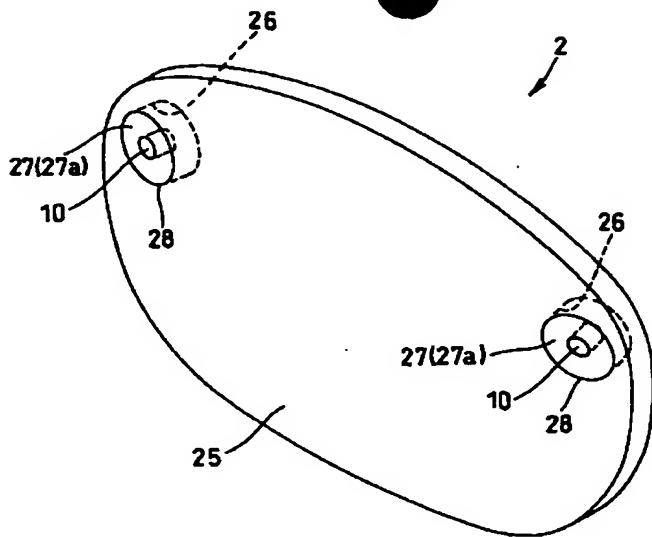
[Drawing 8]



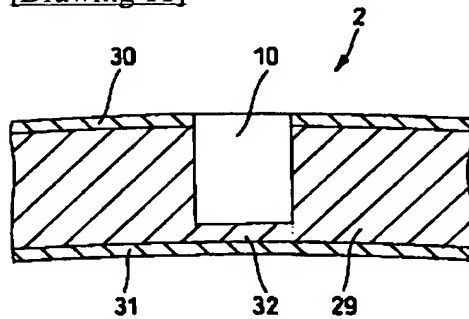
[Drawing 9]



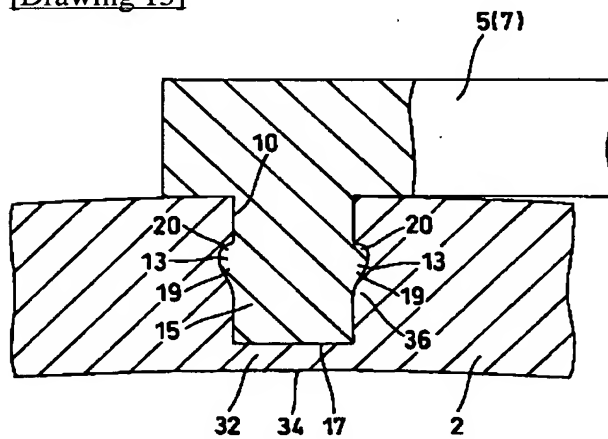
[Drawing 10]



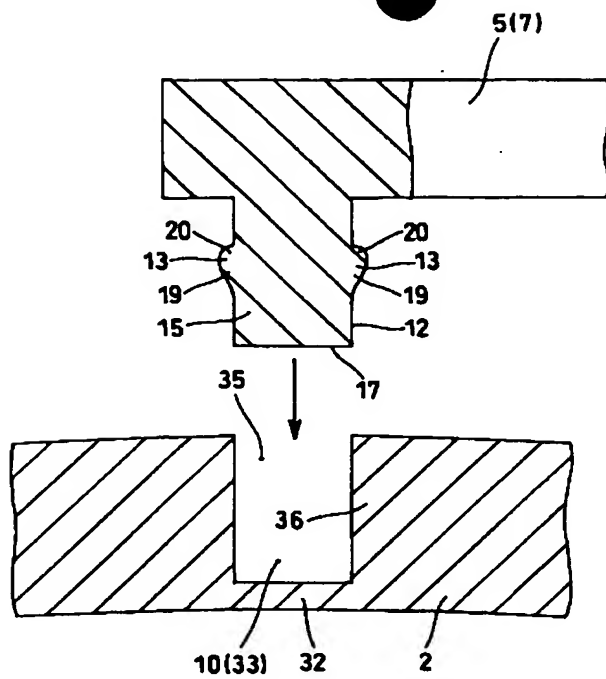
[Drawing 11]



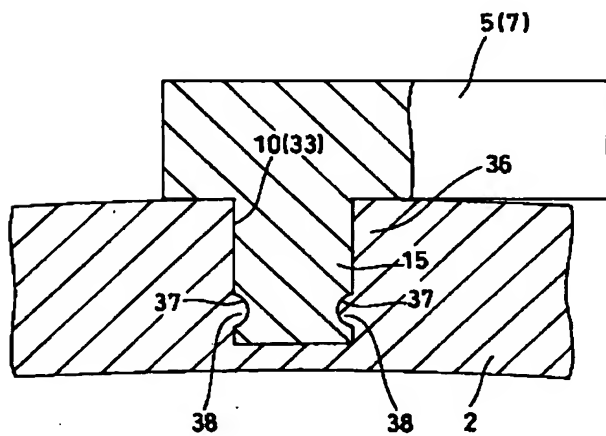
[Drawing 13]



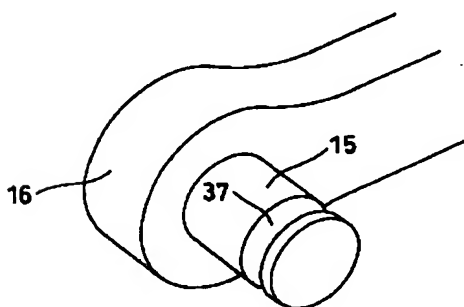
[Drawing 12]



[Drawing 14]

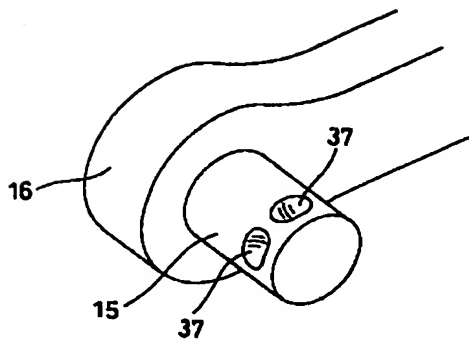


[Drawing 15]

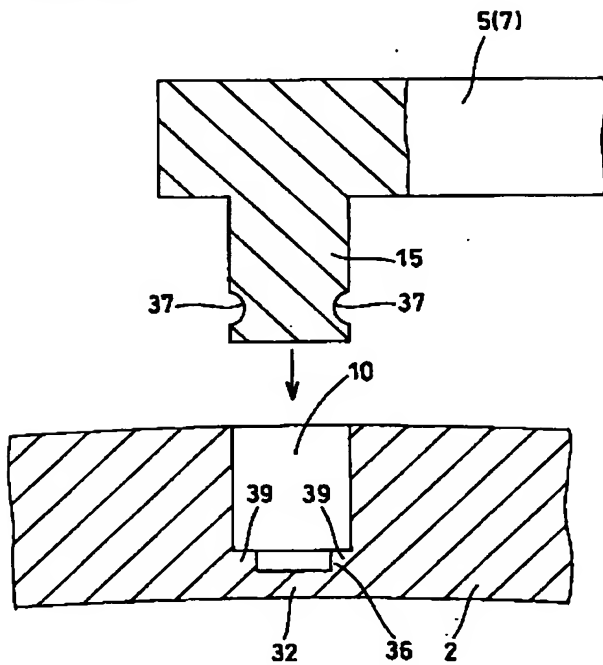


[Drawing 16]

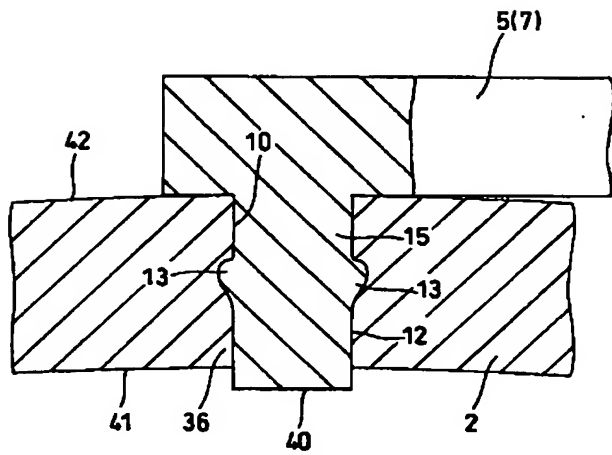




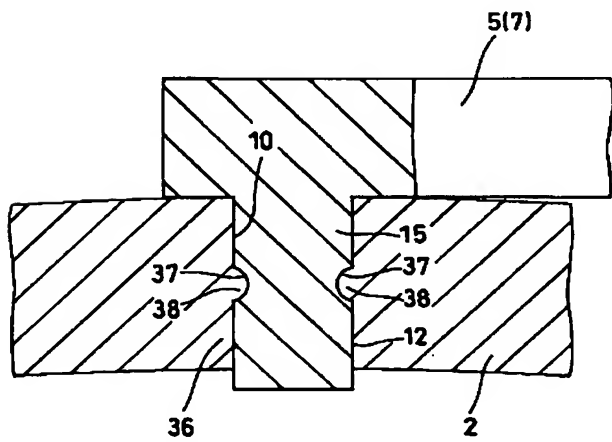
[Drawing 17]



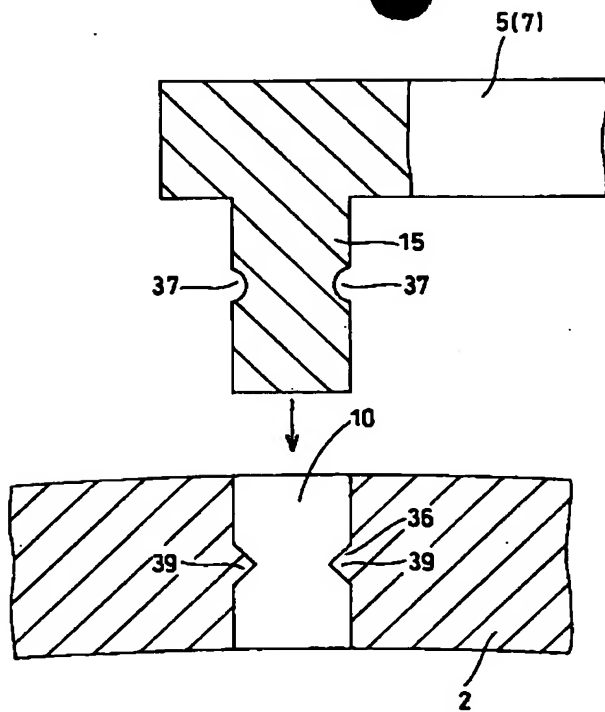
[Drawing 18]



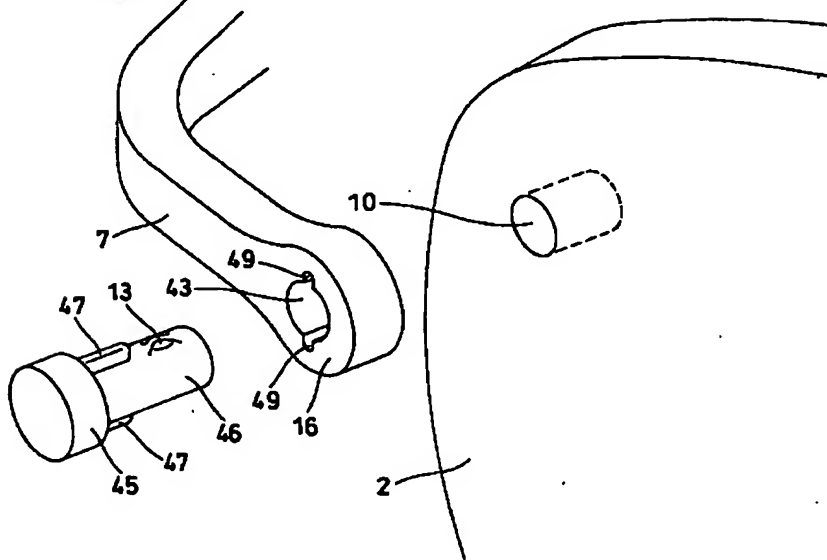
[Drawing 19]



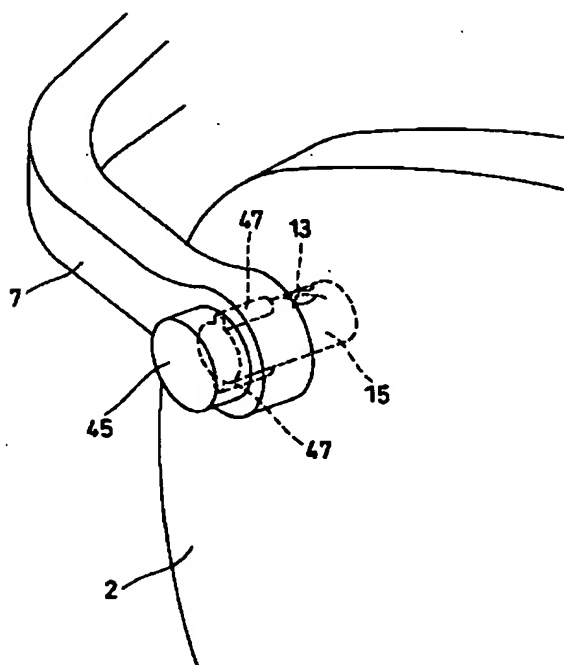
[Drawing 20]



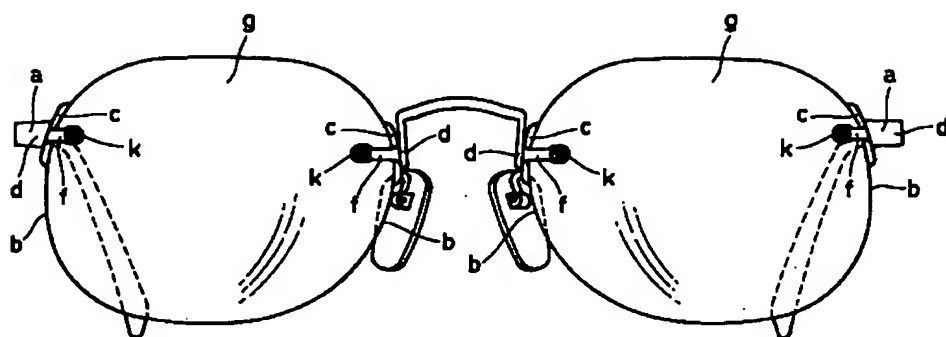
[Drawing 21]



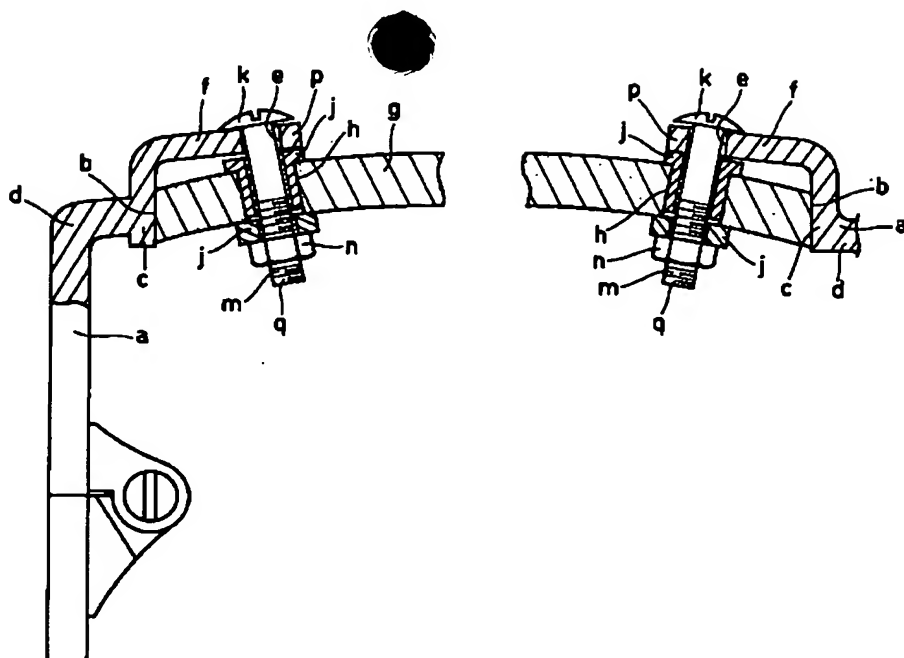
[Drawing 22]



[Drawing 23]



[Drawing 24]



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